FM 5-71-100

DIVISION ENGINEER COMBAT OPERATIONS

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DIVISION ENGINEER COMBAT OPERATIONS

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PREFACE

Field Manual (FM) 5-71-100 is the capstone manual for engineer support to division operations. It is designed as an engineer extension of FM 71-100. This manual serves as a guide for division engineers, their staffs, and subordinate commanders in planning, integrating, and conducting engineer operations to support a division. It also serves as a guide for the division staff and subordinate maneuver commanders on the organization, capabilities, and employment of engineers as a division combat multiplier. Finally, this manual provides corps-level engineer commanders with the principles of division engineer operations effecting their integration into division engineer operations.

This manual applies to all types of divisions and their organic engineers. It sets forth principles which guide the conduct of engineer operations supporting the division. This manual addresses engineer tactics, techniques, and procedures (TTP) as necessary to emphasize critical principles. However, the TTP are intended to be descriptive rather than prescriptive and are not a replacement for the TTP and standing operating procedures (SOPs) unique to the supported division.

FM 5-71-100 is fully compatible with Army doctrine as contained in FM 100-5 and is consistent with other combined arms doctrine. This is not a stand-alone manual. The user must have a fundamental understanding of the concepts outlined in FMs 100-5, 100-15, 71-100, 101-5, 101-5-1, and 5-100. This manual also implements Standardization Agreement (STANAG) 2394, Land Force Combat Engineer Doctrine, Edition 1, and STANAG 2868, Land Force Tactical Doctrine, Edition 4.

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Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

Engineer Operations and the Division Battlefield

The division is the US Army's largest, fixed organization that trains and fights as a tactical team. It is organized with various combat, combat support (CS), and combat service support (CSS) units that make up the combined arms team. A division may be armored, mechanized infantry, light infantry, airborne, or air assault. It is a self-sustaining force capable of independent operations, even for long periods of time, when properly reinforced. Each type of division conducts tactical operations in a low-, mid-, or high-intensity environment. Divisions are the basic units of maneuver at the tactical level.

The division engineer organization (DIVEN) focuses on maneuver at the tactical level. Organic division engineers execute mobility, countermobility, survivability, topographic, and limited sustainment engineering missions to support maneuver in the division area. The division engineer integrates nonorganic and corps engineer assets into the division to augment these capabilities as the battlefield dictates. The structure of division engineers allows them to fight as part of the division's combined arms team.

ROLE OF DIVISION ENGINEERS

Division engineers serve two critical roles for the division. First, they provide engineer expertise at every echelon of command from the division to the company or team. Second, they provide the structure necessary to command engineer units at these echelons. Both of these roles involve the five engineer battlefield functions: topographic, mobility, countermobility, survivability, and sustainment engineering. As a combat multiplier, engineer units focus on maintaining the division's freedom of maneuver and attacking the threat's freedom to maneuver on the battlefield. As part of the division staff, the division engineer focuses on integrating and synchronizing engineer missions to support the division commander's intent and scheme of maneuver.

ENGINEER ORGANIZATIONS

DIVEN organizations are specifically tailored to provide the support necessary to complement the division's capabilities and employment.

Armored and Mechanized Infantry Divisions

Armored and mechanized infantry divisions (henceforth discussed together under the term *armored division)* provide mobile,

armor-protected firepower. They destroy threat armored forces and seize and control land (including population centers and resources) with long-range and flat-trajectory fires. Armored divisions operate best in relatively open terrain where they can use mobility and long-range, direct-fire weapons to their best advantage. The armored division typically has three ground-maneuver brigades (consisting of tank and mechanized infantry battalions) and an aviation brigade.

The armored division has an organic engineer brigade consisting of three mechanized engineer battalions and a headquarters and headquarters detachment (HHD). Each battalion is normally habitually associated with a ground-maneuver brigade. The DIVEN HHD provides centralized command and control (C2) and planning for the total division engineer effort. The DIVEN commander task organizes division engineer companies and corps assets into forward combat engineer battalions. Each battalion habitually trains and operates with its associated ground-maneuver brigade. The DIVEN commander may detach companies from one battalion to another division engineer battalion (main effort) or to another maneuver unit (cavalry (CAV) squadron). Figure 1-1 shows engineers organic to the armored division and the generic engineer task organization for division defensive and offensive operations.

Light Infantry Division

Due to its ability to deploy, the light infantry division provides the flexibility to rapidly accomplish missions on a global basis. It has the ability to operate in terrain or against a threat unsuitable for armored forces. The division conducts operations by exploiting the advantages of restricted terrain and limited visibility. In mid- to high-intensity conflicts, the light division can be augmented with armored forces. Based on the factors of mission, enemy, terrain, troops, and time available (METT-T), a light infantry brigade (with the appropriate CSS augmentation) can be task organized to an armored division. The division is designed to conduct autonomous operations for up to 48 hours. The light infantry division typically has three ground-maneuver brigades (three light infantry battalions) and an aviation brigade.

The light infantry division has an organic light engineer battalion. The division light engineer battalion focuses on supporting the division's fight by task organizing elements of his assault and obstacle (A&O) platoon, combat engineer companies, and corps assets. The task organization of division light engineers depends on METT-T and requires much more flexibility. Division light engineers must be concentrated at the critical place and time under centralized control. For example, two division engineer companies could be massed to one maneuver brigade or one division engineer company massed to an infantry battalion if METT-T dictates this level of support. Austere division light engineer companies require augmentation for extended operations. Figure 1-2, page 1-4, shows engineers organic to the light infantry division and generic engineer task organization for division defensive and offensive operations.

Airborne Division

The airborne division can rapidly deploy anywhere in the world. It conducts airborne assaults in the enemy's rear to secure terrain, interdict routes of resupply, or interdict enemy withdrawal routes. It is ideally suited to seize, secure, and repair airfields and to provide a forward operating base for follow-on forces. The airborne division may be the initial force for contingency operations, and it secures the necessary lodgment for force buildup. The division consists of three ground-maneuver brigades (each with three airborne infantry battalions) and an aviation brigade.

The airborne division has one organic division airborne engineer battalion. The division engineer battalion focuses on

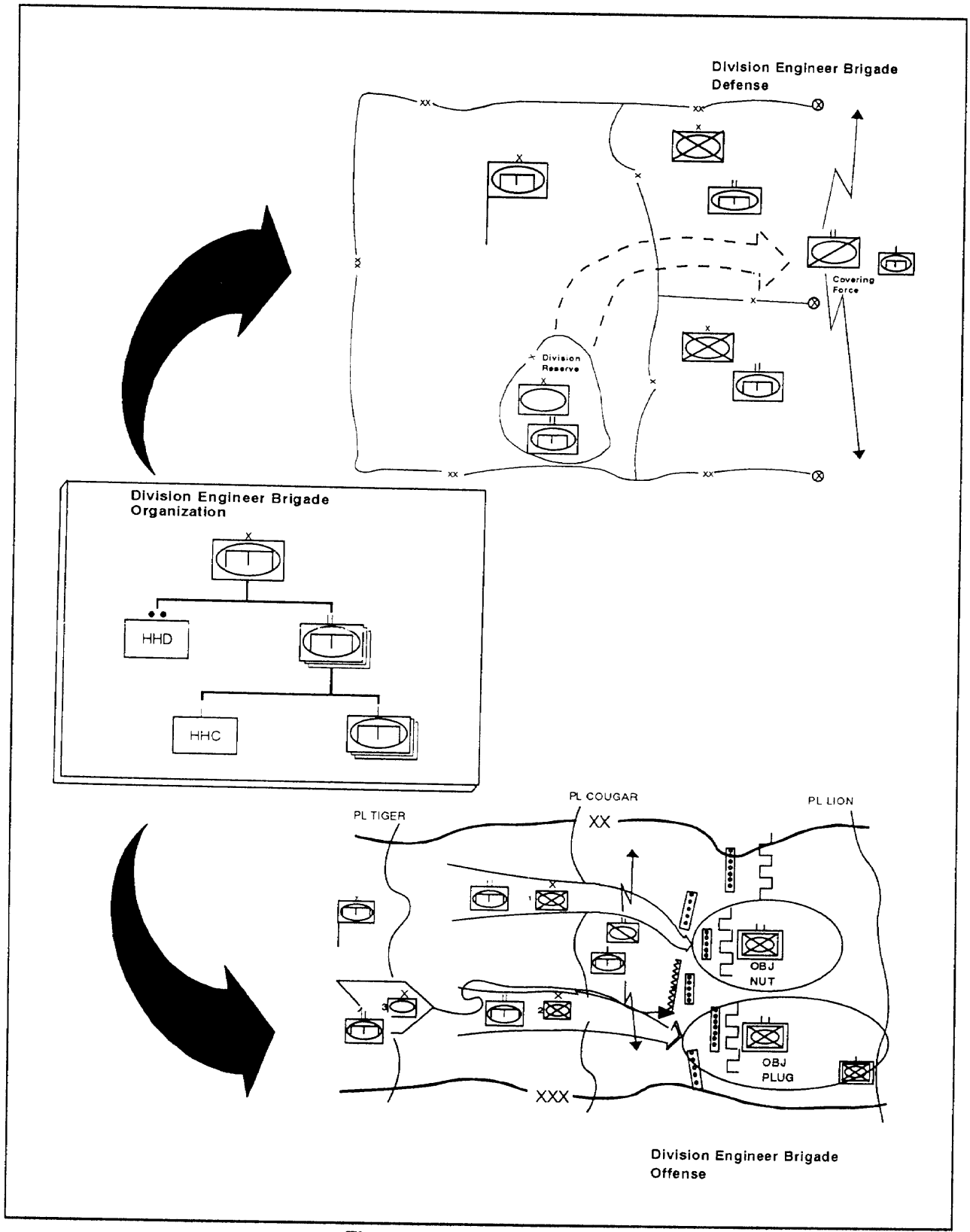


Figure 1-1. DIVEN laydown

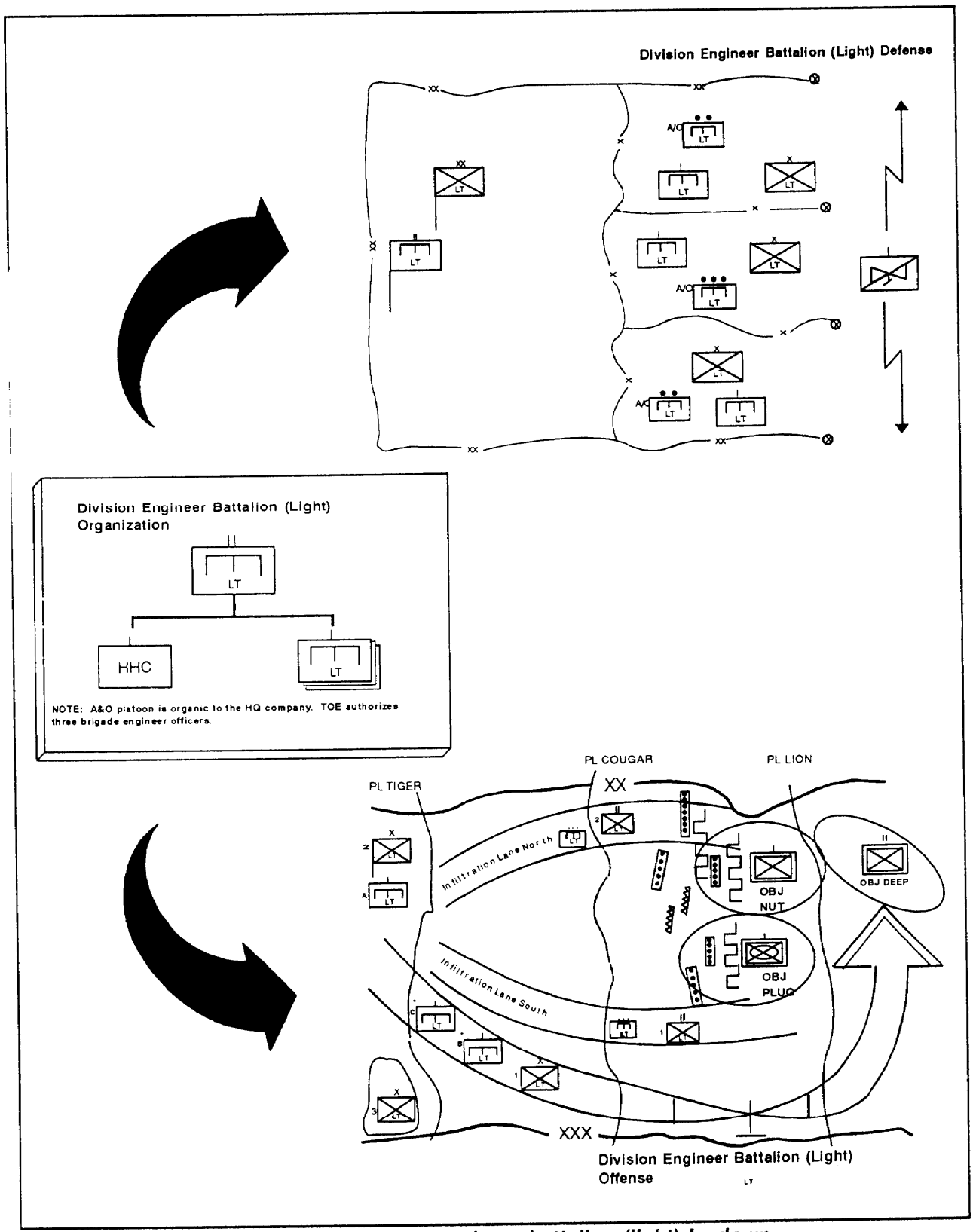


Figure 1-2. Division engineer battalion (light) laydown

supporting the division's fight by task organizing the A&O platoon, combat engineer companies, and corps assets. The task organization of division airborne engineers depends on METT-T and requires flexibility. Division airborne engineer battalions are austere organizations. Organic assets, such as small emplacement excavators (SEEs), Volcanos, and engineer squad vehicles, allow the airborne division engineer battalion to conduct short-term operations. For extended operations, the division airborne engineer battalion normally requires corps augmentation. Figure 1-3, page 1-6, shows engineers organic to the airborne infantry division and the generic engineer task organization for a division offensive and securing an airhead.

Air Assault Division

The air assault division combines strategic mobility with an extremely high degree of tactical mobility within its area of operations (AO). Once on the ground, the air assault division fights like an airborne or infantry division; however, their air mobility permits rapid aerial deployment and redeployment. The air assault division has more ground and aerial antiarmor assets than other light infantry divisions. The air assault division consists of three ground-maneuver brigades (having three air assault infantry battalions each) and an aviation brigade.

The air assault division has one division air assault engineer battalion. The division air assault engineer organization is similar to the division airborne engineer organization. However, the division air assault engineer battalion has enhanced tactical mobility due to the air mobility assets organic to the division. It also has additional haul assets organic to the engineer company. Figure 1-4, page 1-7, shows engineers organic to the air assault infantry division and the generic engineer task organization for division offensive and hasty defensive operations after a deep strike.

CORPS ENGINEER SUPPORT

DIVEN organizations satisfy the most immediate engineer requirements for the division's close operations. However, the division requires corps-level augmentation for engineer mobility missions such as bridging and large-scale breaching operations, intense counter mobility and survivability missions associated with deliberate defenses, and any significant rear missions such as sustainment engineering support for aviation units and support areas. The division engineer considers the available engineer support from corps in order to fully plan and execute engineer missions in the division's sector. A division can be allocated a wide variety of engineer organizations that are structured to suit the division's needs.

Corps Engineer Brigade. The corps combat engineer brigade is a large, flexible organization structured to provide engineer C2 at corps level, beginning with a contingency and going through a force projection to a fully developed corps AO. It contains all of the specialized engineer units, engineer battalions, and engineer group headquarters required to support corps-level operations. The mix and type of units assigned to the corps engineer brigade is determined by the number and types of divisions that make up the corps and by METT-T. In many cases, engineer units from echelons above corps (EAC) will be task organized to the corps engineer brigade. See Figure 1-5, page 1-8, for a sample corps engineer brigade assigned to a corps consisting of one light infantry division, three armored divisions, and an armored CAV regiment.

Combat Engineer Group. An engineer group is a flexible C2 headquarters with

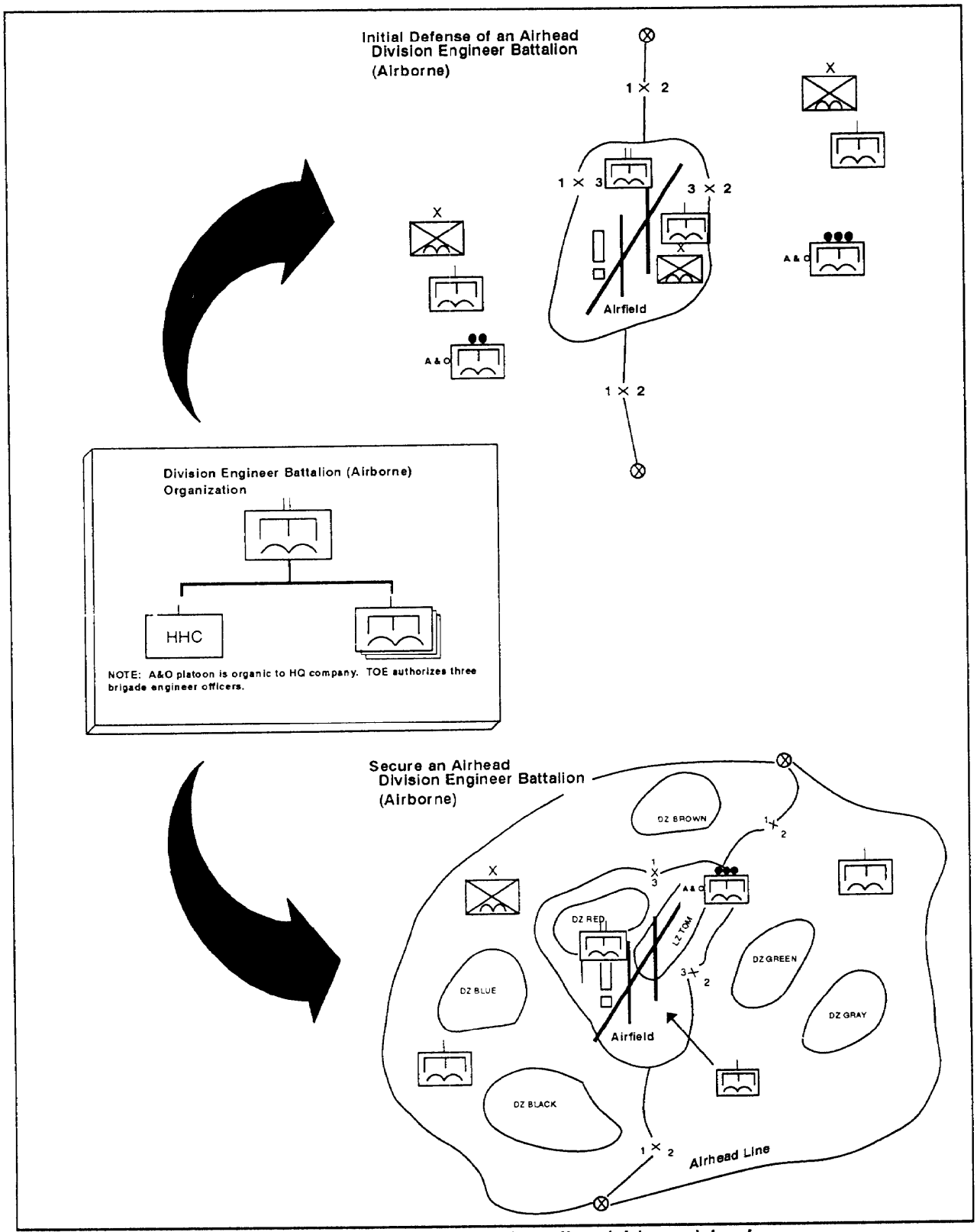


Figure 1-3. Division engineer battalion (airborne) laydown

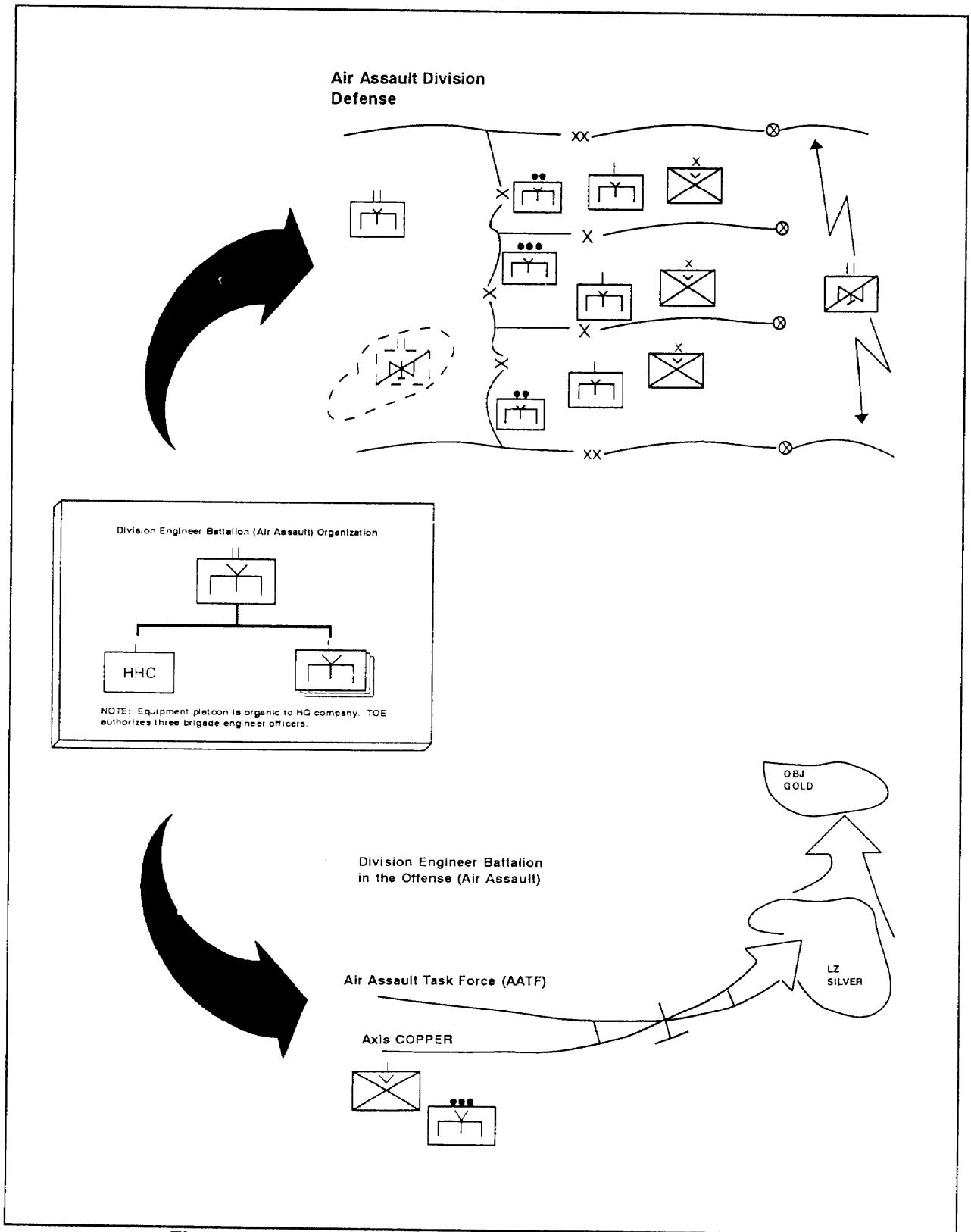


Figure 1-4. Division engineer battalion (air assault) laydown

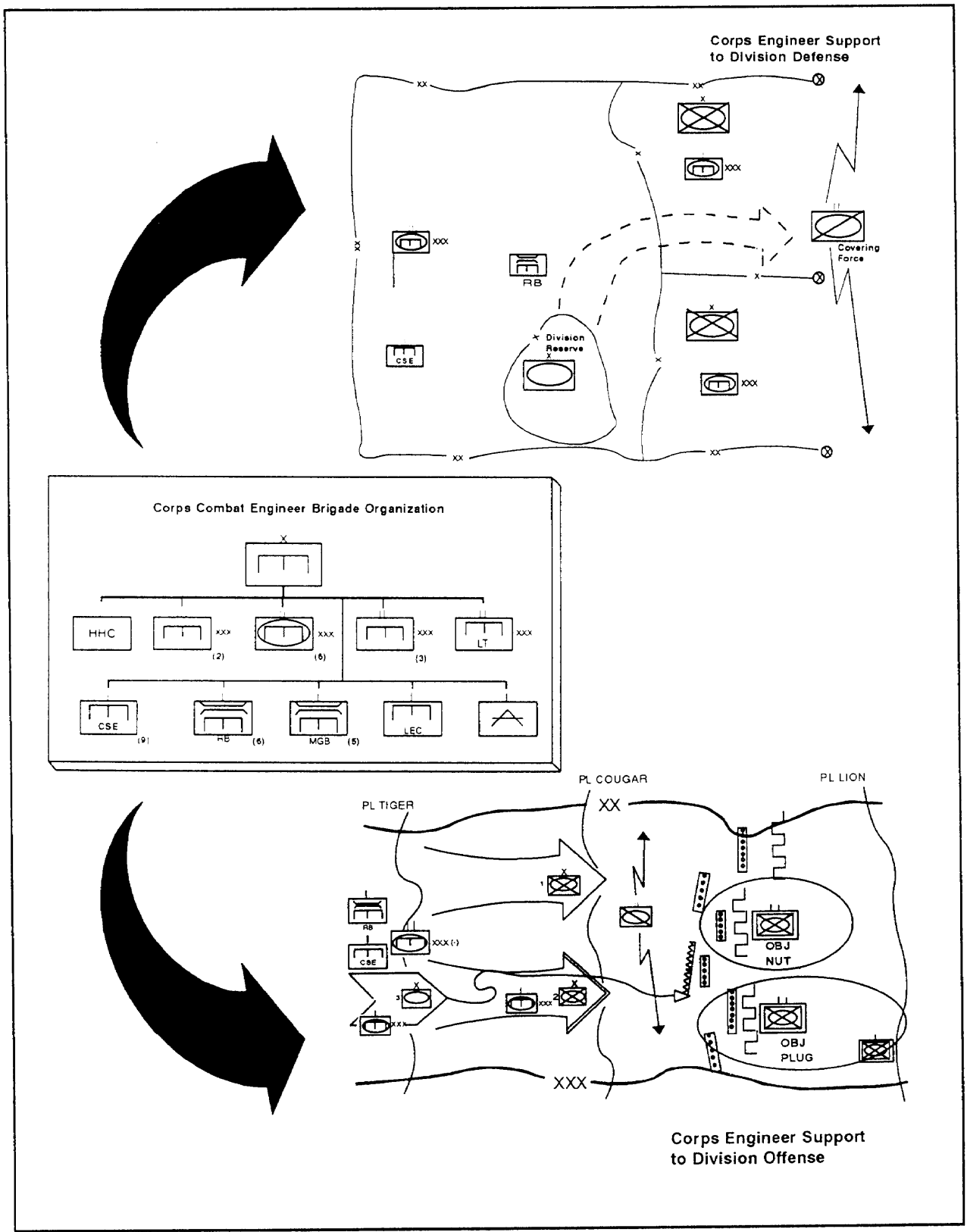


Figure 1-5. Corps engineer units augmenting DIVENs (armored division)

engineer battalions and companies assigned to it based on the analysis of METT-T.

Engineer groups are primarily designed to support divisions. In such a role, the group may become the engineer headquarters for a light division when the division receives significant augmentation from the corps engineer brigade. The group may also become the engineer headquarters for a special-purpose mission, such as a river-crossing operation, for either light or armored divisions. When not required for a front-line mission, the group normally assumes responsibilities in the corps or division rear, where it directs engineer missions supporting corps units such as the corps aviation brigade, corps artillery, and corps support command.

When the combat engineer group enters the division sector, it comes under the control of the division. The division engineer advises the division commander on the best way to use the group. This pertains to both light and armored forces. In special cases, the division commander may transfer DIVEN organizational responsibilities to a combat engineer group that has been task organized to the division on a long-term basis. Normally, this is only done for airborne, air assault, or light divisions when corps engineer augmentation surpasses the C2 capability of the DIVEN battalion headquarters.

A combat engineer group is used most frequently within a division to act as a headquarters for all corps combat engineers, bridge companies, combat support equipment (CSE) and light equipment companies (LECs), and EAC units such as combat-heavy battalions that have been task organized to a division on a mission basis.

Typical corps engineer organization support and laydown for armored and light divisions are depicted in Figure 1-5 and Figure 1-6, page 1-10. (See Figures 1-1 through 1-4, pages 1-3 through 1-7, for DIVEN assets.)

CLOSE, DEEP, AND REAR OPERATIONS

Since the location of engineer functions on the battlefield dictates different planning requirements, coordination, and execution techniques, division engineer leaders must understand the relationship between engineer functions and close, deep, and rear operations (Figure 1-7, page 1-11).

Close Operations

A division's close operations include the simultaneous close, deep, and rear operations of its subordinate brigades and battalions. The outcome of the division's close operations will ultimately determine the success or failure of the division battle. Deep and rear operations are focused primarily on creating conditions favorable for winning the close operation.

Close operations are usually the main effort for division engineer planning and execution. The elements of combat power (maneuver, firepower, protection, and leadership) are critical for success in close operations. They are also essential to understanding the dual roles of the DIVEN commander as a division staff officer and the DIVEN organization commander.

The division engineer plans, coordinates, and synchronizes mobility and countermobility operations to ensure the division freedom to maneuver. Mobility and countermobility operations also increase and protect division firepower. This preserves the division's freedom of action, reduces friendly force vulnerability, and helps gain the advantage of position. The division engineer also plans, coordinates, and

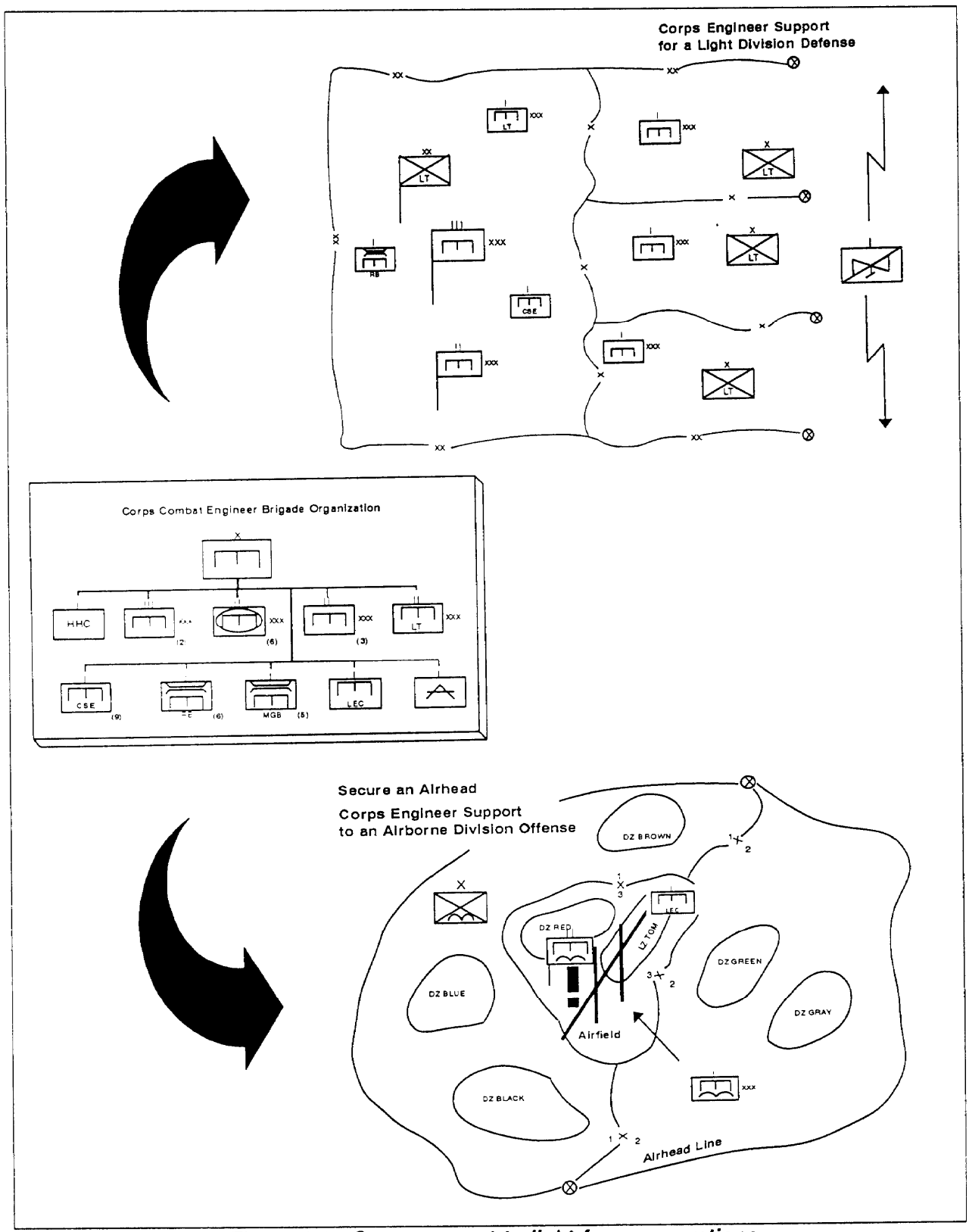


Figure 1-6. Corps support to light forces operations

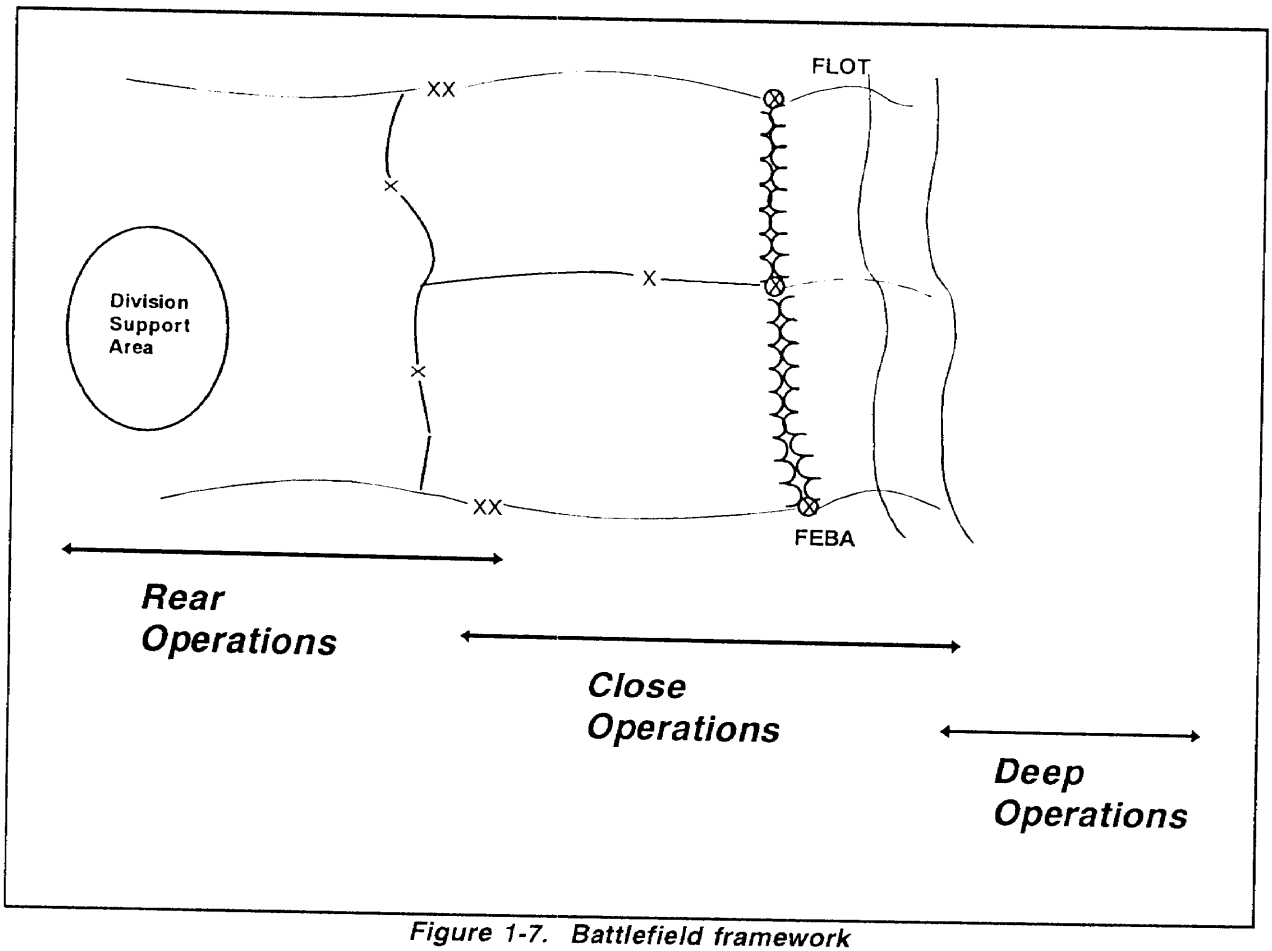


Figure 1-7. Battlefield framework

synchronizes survivability operations to support the protection of division forces. This ensures that division forces have adequate fighting positions and camouflage, can reposition and resupply, and can conduct deception operations as necessary. Finally, the division engineer enhances division leadership by being technically and tactically competent. This enables him to provide purpose, direction, and motivation for the engineer forces operating for the division during combat.

Division engineer units perform a significant role in enhancing the elements of combat power at the tactical level. Division engineers enhance maneuver by breaching obstacles to preserve freedom of movement and by placing obstacles to gain the advantage of position. They affect firepower by properly integrating obstacles with direct- and indirect-fire systems and fire-control measures. Division engineer units protect division forces by providing technical expertise and labor, augmented by the supported force, to construct survivable firing positions for weapon systems, fortifications, protective obstacles, and strongpoints. All missions carried out by division engineer units increase the division's war-fighting capability. This gives individual soldiers confidence in the division plan and, ultimately, confidence in their leaders.

Deep Operations

The division engineer's effort in deep operations focuses on disrupting the timing of committed threat forces, shaping future close operations, and preventing or hinder-

ing enemy uncommitted forces or resources from influencing the close operation. The division engineer plans for deep operations by supplementing the commander's intelligence preparation of the battlefield (IPB) process and by the employment of engineer assets. Supplementing the IPB involves extensive terrain analysis (topographic engineering) and high-value target (HVT) analysis or nominations. The employment of engineer assets focuses on situational obstacle planning and on using scatterable mines against HVTs or along critical choke points. If deep operations include the use of ground forces (such as a raid or securing an airfield), engineer forces must be integrated where required. In support of this deep operation, division engineers conduct breaching, assault bridging, lane marking, forward aviation combat engineering support, and counter mobility support for a hasty defense.

Rear Operations

Division engineers support the division commander's intent for rear operations by ensuring the freedom of maneuver and the continuity of operations through sustainment. They rely heavily on additional corps engineer support. The division engineer integrates and synchronizes mobility and sustainment engineering operations for lines of communication (LOC) construction and maintenance, survivability of critical C2 nodes or assets, and countermobility for base cluster defenses.

Division engineers upgrade main supply routes (MSRs) and other routes for movement of sustainment and C2 traffic and for repositioning the division's reserves and fire support. Numerous other sustainment activities (such as facilities maintenance and construction for CSS and aviation) require engineer support in case of rear area damage. Engineers assist the supported unit in constructing fortifications, protective obstacles, and hasty fighting positions for critical C2 nodes, CS or CSS organizations, and base cluster defenses.

Engineers support the division by providing assets to enhance force protection. Force protection involves those protective measures (predetonation fences cover-from-view screens; sacrificial areas, walls, and roofs; blast zones; barricades; and building evaluations) taken against low-level threats or typical terrorist acts. For countermobility operations, engineers not only advise units but also construct obstacles in support of base cluster defenses.

DIVISION ENGINEER ROLE IN THE BATTLEFIELD OPERATING SYSTEM

The division engineer must understand the battlefield operating systems (BOSs) and his role in support of each system. It is this role that drives the interaction between the division engineer and other combined arms staffs and helps to identify engineer missions supporting all facets of the division plan. A complete understanding of the BOS is essential for synchronization of engineer operations and unity of effort.

Intelligence

Division intelligence assets provide the capability to locate and attack the threat in support of close, deep, and rear operations. The IPB is the major product resulting from the planning process that links the intelligence BOS with other operating systems. The IPB orients all planning and execution for the division. The division engineer uses

the engineer battlefield assessment (EBA) to provide input to the IPB. He focuses on terrain analysis and the threat's mobility, countermobility, and survivability capabilities. The division's terrain detachment plays a key role in assisting the IPB and developing terrain products for the EBA and IPB processes. The division engineer nominates named areas of interest (NAIs) and priority intelligence requirements (PIRs) to the Assistant Chief of Staff, G2 (Intelligence) (G2) to confirm or deny critical engineer characteristics of the enemy situation and terrain.

Engineer forces can act as an intelligence collection asset for technical or tactical reconnaissance. Technical reconnaissance missions focus on collecting information about a target, area, or route. This type of reconnaissance gathers engineer information about the target without regard to the enemy. It is usually conducted under a low-level threat and in areas physically controlled by friendly forces. Engineer forces can anticipate the following technical reconnaissance missions: river crossing (unopposed), engineer resource, bridge, route and road, forward landing strip, tunnel, ford and ferry crossing (unopposed), and water resource.

Division engineers supplement the combined arms reconnaissance effort through tactical reconnaissance. Tactical reconnaissance is conducted against a target in areas where enemy contact is likely and the reconnaissance mission is an integral part of confirming or denying the IPB. Division engineers can anticipate the following tactical reconnaissance missions: enemy obstacle, enemy engineer activity, river, landing zone (LZ) or pickup zone (PZ), terrain specific, situational obstacle locations, reserve or directed obstacles (bridge demolitions and road craters), and military operations on urbanized terrain (MOUT) (building evaluations and utility facility reconnoiters). For tactical reconnaissance, division engineers are normally task organized to maneuver reconnaissance elements.

Maneuver

Maneuver at division level places or moves battalion- and brigade-size combat forces into positions where they can bring direct and indirect fires to bear on the enemy with the greatest effectiveness. The relationship of engineer functions and maneuver differs significantly in the offense and the defense. However, a common thread in the two missions is enhancing the division's ability to concentrate combat power.

In the offense, the division engineer focuses on mobility with river-crossing and breaching operations. This enables the division to go where it wants to and concentrate combat power against a threat weakness or create a weakness. The engineer's planning and integration impact on the total scheme of maneuver. For example, the force allocation ratios for the breach organization (support, breach, and assault forces) and the synchronization of the breaching fundamentals (suppress, obscure, secure, and reduce (SOSR)) have a direct impact on the task organization and subordinate breaching tasks. The division engineer also plans for counter mobility support to protect the flanks with situational obstacles and for the transition to a hasty defense.

In the defense, the division engineer focuses on mobility, countermobility, and survivability operations. This allows the division to fight from survivable positions against the threat's fires and to use obstacles to attack the threat's ability to maneuver. The combination of the two allows the division to mass fires to complete the threat destruction. The division engineer plans obstacle zones that are tied directly to the division's maneuver scheme. The division commander's intent provides focus to the countermobility effort. It also provides the necessary obstacle control for tactical repositioning.

Engineer forces breach enemy obstacles, clear routes, construct tactical and protective obstacles, build fortifications, and

construct fighting positions. All activities are directly related to and supportive of the decisive commitment of combat power.

Mobility and Survivability

Mobility and survivability (M/S) operations provide mobility to division units; degrade the enemy's ability to move on the battlefield; and provide protection to division personnel, equipment, and supplies.

The M/S BOS requires the combined efforts of all combat, CS, and CSS forces. Missions in this BOS are not the total responsibility of the engineer force. Conducting a breach operation is an example of a mobility mission requiring a total combined arms effort. Engineer involvement is only one aspect of the operation (reduction of lanes through the obstacle). The bulk of support requires the synchronized effort of all arms to suppress, obscure, and secure the obstacle. Emplacing fighting positions is an example of a survivability mission. While engineers provide the equipment and soldiers to construct the positions, the type and level of survivability is largely based on the Intelligence Officer's (US Army) (S2's) analysis of the threat and the maneuver commander's priorities. Furthermore, while the engineer digs the position, the location and orientation of each position are based on the direction of the team commander.

The division engineer has two roles in the M/S BOS. The first is to advise the division headquarters on M/S operations. The second is to assess and assign engineer missions in support of this BOS, as well as all other BOSs. Figure 1-8 illustrates some of the engineer tasks that support the M/S operating system. Chapters 3, 4, and 5 discuss both the division engineer's functions and engineer unit missions in support of the M/S BOS for offensive, defensive, and other tactical operations.

Fire Support

Fire support integrates the full range of fire-support systems to support the division's maneuver scheme and to preserve freedom of maneuver by fighting deep, close, and rear operations. Overwhelming counterfire is also a critical element of fire support. The challenge to the division engineer is the timely and effective integration of the engineer battlefield functions. Offensive and defensive operations have different fire support integration concerns with engineer missions.

In the offense, the division engineer focuses integration efforts with fire support in three areas: suppression, obscuration, and counterfires. For breaching operations, suppression is the massing of all available fires on threat personnel, weapons, or equipment. The division engineer coordinates indirect fires to isolate the breaching site and to protect the breach force. He ensures that well-synchronized fire-control measures are planned for timely massing, lifting, and shifting. Obscuration hampers the threat's observation and target acquisition and conceals friendly activities and movement. The division engineer coordinates screening or deception smoke to protect the obstacle reduction effort and the passage of assault forces. Counterfires are crucial in protecting the force as it closes in on the enemy and makes the initial penetration. The division engineer coordinates fire-support counterfires with breaching and river-crossing operations during critical periods of vulnerability. This protects the combat power of support, breach, and assault forces.

In the defense, the division engineer focuses on integrating obstacle effects and indirect fires. For each obstacle effect, specific integration techniques of indirect fires are required. For example, to achieve a disrupt obstacle effect, the engineer coordinates indirect fires to cover the obstacles while direct fires target the bypass. In contrast, to

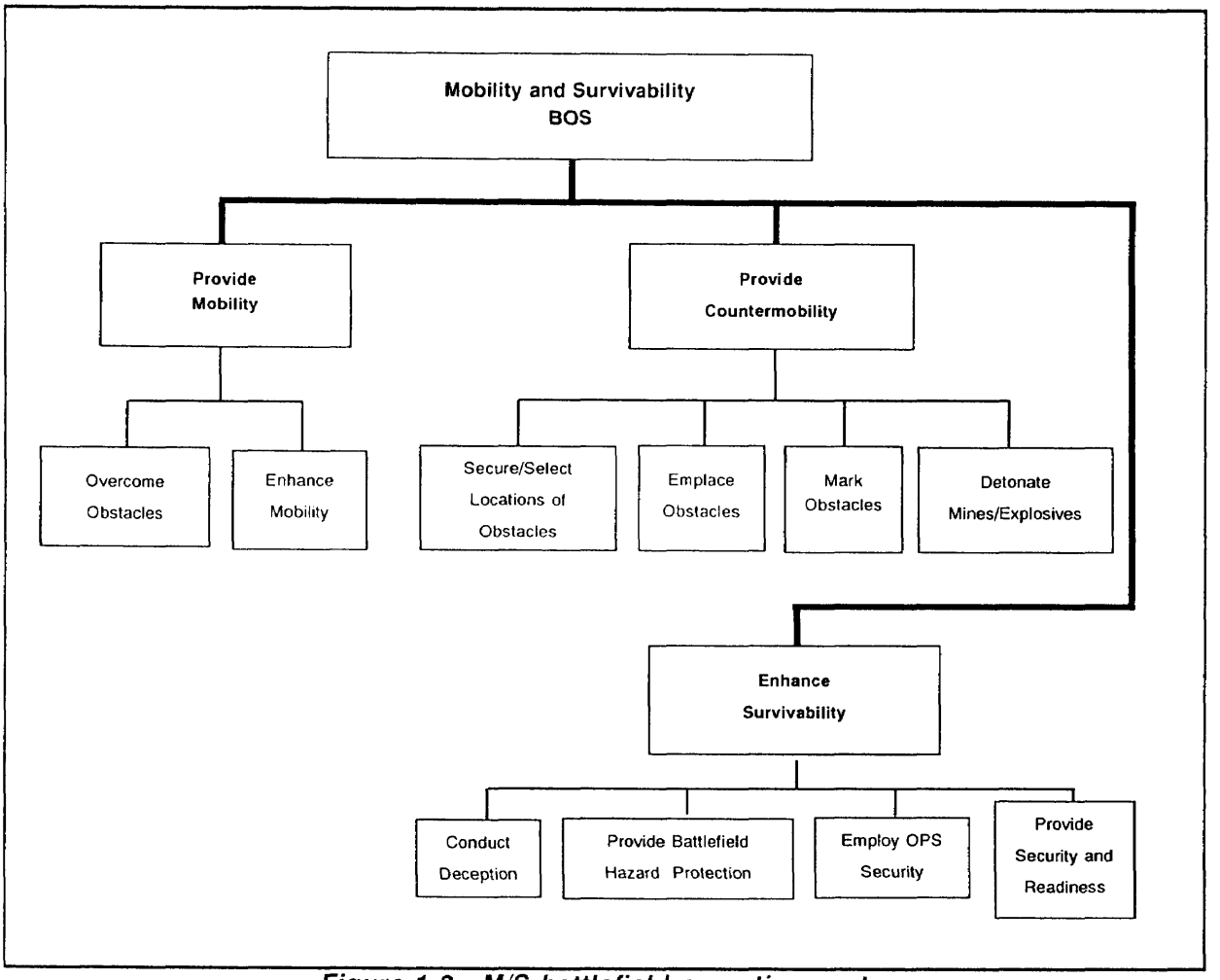


Figure 1-8. M/S battlefield operating system

achieve a turn effect, artillery groups are massed at the point at which the turn is to be initiated and then throughout the rest of the obstacle effect. The division engineer ensures the scheme of fires and obstacles are mutually supportive.

The division engineer also coordinates with the fire-support representative regarding the use of indirect-fire assets to deliver scatterable mines and situational obstacles. While the field artillery delivers some types of scatterable mines, the engineer is the principal advisor to the maneuver commander for the tactical employment of all scatterable mines, regardless of the means of delivery. The engineer, in conjunction with the operations and fire-support officers, plans and coordinates the employment of scatterable mines and the fires that cover them. Field artillery scatterable mines may be used to employ situational obstacles. Again, the engineer plans and coordinates the employment of situational obstacles in conjunction with the operations and fire-support officers.

Engineer forces assist fire-support assets in several ways. Providing mobility support for repositioning artillery assets is critical for their survivability against the threat's counterfire efforts. Constructing survivable firing positions for artillery assets is another engineer function. Constructing survivable

artillery firing positions becomes a high priority for light forces due to their lack of artillery mobility. Forward aviation combat engineering is another concern of preserving the fire support.

Air Defense

Air defense (AD) degrades or reduces the effects of enemy air attack on friendly units, supplies, and facilities. The division engineer coordinates this protection with M/S functions. He focuses integration efforts in three distinct areas. The first area is AD protection for critical engineer assets, such as the Class IV/V (obstacle) supply point, concentrations of engineer construction equipment, and tactical bridging assets. The second area is coordinating AD protection of large formations at critical choke points, such as during breaching and river-crossing operations. The third area for coordination is AD protection for engineer forces. The division engineer must be able to interface with the AD officer on integration issues in terms of vulnerability, criticality, recuperability. and the air threat against engineer operations.

Engineer forces construct fighting positions for forward AD assets, protecting them not only against the threat's suppression of enemy air defenses (SEAD) operations but also against direct and indirect fires.

Combat Service Support

CSS sustains the fight. The division engineer focuses his integration efforts on three different areas of CSS operations. The first area is the sustainment of engineer battlefield functions. Battlefield requirements for close, deep, and rear operations must be anticipated and then integrated and pushed forward into the fight. The second area is the engineer mission support to the division's CSS operations. As discussed earlier in the rear operations section of the battlefield framework, division engineers play a significant role in sustaining the division. Finally, engineer unit sustainment must be integrated. This encompasses both division and corps engineer forces and is discussed in Chapter 6.

Command and Control

C2 allocates, prioritizes, and synchronizes assets to employ and sustain combat power. The division engineer must integrate C2 of all engineer battlefield functions into the division C2 process for close, deep, and rear operational support. The integration of engineer C2 activities at each division command node creates a responsive, synergistic relationship between division engineer support, engineer unit C2, and division units. It must maximize use of division C2 and engineer C2 channels to achieve responsive support. Timely and effective engineer task organizations, annexes, fragmentary orders (FRAGOs), operation orders (OPORDs), and operational updates are all products of effective integration of engineer missions and C2. Chapter 2 provides additional discussion on the integration of engineers and maneuver C2.

Engineer forces may also assist in hardening division C2 by constructing fortifications for critical division command, control, and communications (C3) nodes. Continuous, uninterrupted C3 is vital to maintaining the initiative and acting within the enemy's own decision cycle. As the battlefield becomes increasingly nonlinear, engineers play a more vital role in constructing or hardening existing facilities that give division C3 nodes an edge against the enemy's deep operations. The division engineer must be sensitive to these needs and must constantly coordinate with the division Assistant Chief of Staff, G3 (Operations and Plans) (G3) and the communications-electronic signal officer (CESO) to identify C3 survivability requirements early.

CHAPTER 2

Command and Control

Command and control of engineer units and functions is essential to providing the division with responsive engineer support. It enables the DIVEN commander to effectively integrate engineer battlefield functions into division plans as well as synchronize the effort involved in the current fight. This chapter focuses on establishing effective engineer C2 in the division. It draws on the C2 principles and structure outlined in FMs 101-5 and 71-100.

Engineer C2 involves the functional arrangement of personnel, equipment, communications facilities, and procedures to enable the DIVEN organization to keep pace with the division's decision cycle and accomplish assigned missions. Effective C2 and execution ensures that engineer capabilities are properly applied to gain the maximum combat multiplying effect.

ROLES OF THE DIVEN COMMANDER

Leadership is a vital component of any C2 system. The DIVEN commander provides the purpose, direction, and motivation necessary for his soldiers to accomplish the difficult and dangerous tasks that support the combined arms team. His dual roles as both a commander and division staff officer provide some unique leadership challenges.

The relationship between the DIVEN commander and his division commander is important to effective C2 of engineers. The division commander formulates a concept of the operation, intent, and vision of the battlefield that cuts across all functional areas at his echelon. To help maintain his command focus, the division commander must rely on his functional area commanders to provide the necessary combat-, CS-, or CSS-specific control that permeates all subordinate echelons.

The division commander relies on the DIVEN commander as his expert on engineer operations. The DIVEN commander supports the division commander by commanding organic engineers that remain under division control and corps engineer units attached to his organization to support the division. As the division engineer, he assists the division commander in control of all engineer operations within the division as necessary to ensure responsive, effective, and cohesive support.

The DIVEN commander's primary role is command. He is assisted by a coordinating staff. The broad duties and responsibilities of commanders and coordinating staffs are outlined in FM 101-5. The principal functions of the DIVEN commander and his staff include–

- Commanding subordinate organic and supporting engineer units.
- Using engineer C2 organizations to hear, see, and understand all engineer battlefield missions within the division.

- Assigning specific missions to engineer units through DIVEN unit orders.
- Using engineer C2 organizations to hear, see, and understand all engineer battlefield missions within the division.
- Issuing timely instructions and orders to subordinate engineer units to facilitate subordinate planning, preparation, and integration.
- Assessing unit performance, anticipating changes, and issuing the necessary FRAGOs directly to the engineer unit.

The DIVEN commander is also the division engineer, a division special staff officer. He is assisted in this role by a special staff section under the leadership of the Assistant Division Engineer (ADE). The duties and responsibilities of the special staff and the division engineer are outlined in FM 101-5. The division engineer is responsible for functional control of both organic and supporting corps engineers. The division engineer supports the division commander in exercising functional control by–

- Visualizing the future state of engineer operations in the division.
- Formulating concepts for engineer support to meet the division commander's intent.
- Identifying the engineer tasks necessary to support the division plan.
- Developing and integrating future engineer plans to support the division fight.
- Coordinating with the corps engineer on corps engineer plans, status of division engineer missions, and identification of division requirements for corps engineer assets.
- Using the EBA and mission analysis to compute resource and force requirements for making recommendations for engineer task organization and command and support relationships.
- Developing a scheme of engineer operations concurrently with maneuver courses of action.
- Making recommendations to the division commander concerning priorities and risk.
- Developing specific engineer missions and conveying them to subordinate maneuver units and their staff engineer through the division OPORD and engineer annex.
- Monitoring the execution of engineer orders and instructions.
- Adjusting the engineer plan, as required, based on feedback from both maneuver and engineer units.
- Identifying engineer requirements beyond the capability of available units and requesting additional assets from corps, as needed.

In his dual roles, the DIVEN commander assists the division commander by monitoring the total engineer fight, anticipating problems, providing timely recommendations, and participating in future planning while continuing to command all engineers under division control. To accomplish all of these tasks, the DIVEN commander positions himself, his staff, and his representatives where they can best provide C2 of engineers and engineer functions for the division commander. In his role as commander, the DIVEN commander may be at the scene of the engineer main effort while his staff continues the effort in the DIVEN command posts (CPs). As the division engineer, he must be accessible to the division's decision makers. He does this by

ensuring that his coordinating staff and representatives at the division CPs fully understand both his and the division commander's intent and are aligned for mutual support and synchronization.

The DIVEN commander must achieve an efficient and flexible C2 system in the division. While FM 71-100 provides a base C2 structure, each division commander modifies that structure based on his personality and leadership style. The DIVEN commander must identify the division's decision makers and the key decision-making nodes. For example, some division commanders may make heavier use of the command group or increase the role of the tactical (TAC) CP in decision making for future fights. Each DIVEN commander must make an assessment of his division's C2 "personality" and modify his engineer C2 system accordingly. C2 of engineers must be responsive to the needs of the division commander as well as those of subordinate engineer units.

The DIVEN commander must establish a clear delineation of functions and responsibilities in order to influence and keep pace with the division's decision cycle. The cycle of acquiring information, making recommendations and decisions, issuing instructions, and ensuring engineer actions are set in motion is a continuous process requiring organization and efficiency.

The DIVEN commander issues guidance to his staff and division representatives and makes tactical decisions based on guidance and coordination with the division commander. He must maintain flexibility to move to the point of the engineer main effort or to the point of decision making.

To provide responsive engineer support to a division, the DIVEN commander must properly task organize his force. He fosters the integration of subordinate units through habitual association with the maneuver brigades. He uses this habitual relationship as a basis for task organization wherever possible.

The division will frequently need and receive additional engineer units from corps. These units are integrated into the overall division task organization. Corps units may be task organized into or along with the division's organic engineer units supporting the maneuver brigades or may be given independent missions in the division area.

The chief purpose for task organizing is to increase the responsiveness of support to the maneuver brigade commanders. Commanders of task-organized engineer units (attached, operational control (OPCON), or direct support (DS)) must answer to the needs of the supported commander first. Even in cases where engineer units are general support (GS) and receive their missions from corps, they still attempt to satisfy the needs of the supported commander.

The DIVEN commander gives his subordinates missions and guidance supporting the missions the division commander gives to his maneuver brigades. The DIVEN commander must afford his subordinates a great deal of freedom of action and initiative. He must remain focused on engineer missions rather than the method of execution. He uses intent to give subordinate engineer commanders the necessary framework within which to take initiative. Freedom of subordinate action, mission focus, and clear intent are all vital components of establishing effective engineer C2 between the DIVEN commander and engineers task organized to maneuver brigades.

ENGINEER FUNCTIONAL AREA C2

The responsibility to provide engineer control is key to establishing an effective engineer C2 organization. To effectively control the engineer effort, the division engineer must understand the division C2 organization and integrate engineer operations into the division's planning and decision cycle.

The division normally commands and controls the fight through a command group and three CPs. The CPs are the TAC CP, main CP, and rear CP. FM 71-100 provides details on the exact composition and layout of the command group and each CP. While these details are important, it is more important to understand the roles and responsibilities of each CP within the division's C2 organization.

Functionally, the division TAC, main, and rear CPs are the same in every division. The engineer functions are also the same, regardless of the type of division. The actual size, composition, and organization of each engineer cell adjusts, based on the type of division, to provide an acceptable level of engineer unit control. Understanding how the division CP system works and what engineer functions occur at each of the division CPs is fundamental to establishing C2 of engineers. Figure 2-1 illustrates the relative battlefield location of each division CP. This only provides a base structure; each division may modify its C2 organization based on the personality of the commander and METT-T.

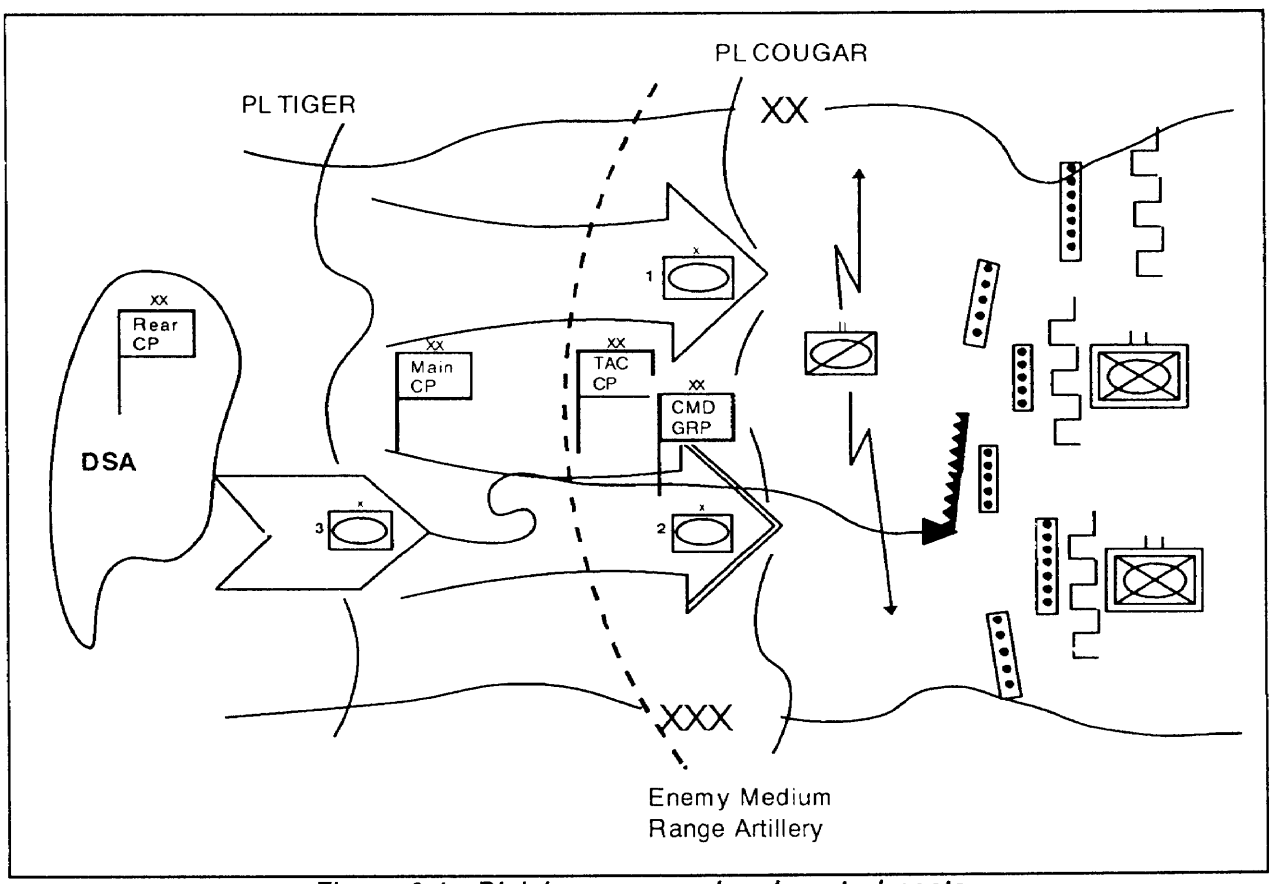


Figure 2-1. Division command and control posts

Division Command Group

The command group consists of the division commander and selected members of his staff. It is not a fixed organization but is tailored to meet the C2 needs of the mission. The division commander identifies the critical events requiring his personal influence. He also anticipates the rapid decisions and orders that will be required and tailors the command group to provide the necessary expertise. The command group moves forward from the TAC CP and initially positions itself with the main effort. This forward position allows the division commander and selected staff to see the battle, directly influence the action, and make face-to-face contact with brigade commanders when necessary. The division commander will often require the division engineer to be part of his command group.

Division TAC CP

Functions of the TAC CP. The TAC CP controls the close fight. It locates in the main battle area (MBA) close to the forward brigades. It is structured to synchronize and coordinate maneuver, fire support, and engineer operations in the division close battle. When fully active, the TAC CP serves as the net control station (NCS) for brigade and separate battalion reports. It receives, posts, and analyzes reports from the maneuver brigades and responds to immediate tactical requirements. The TAC CP is principal to analyzing and disseminating combat intelligence for the close fight. It also provides centralized synchronization of fires to committed forces within the division. The assistant division commander for maneuver (ADC-M) or his designated representative controls the TAC CP.

Engineer Functions in the TAC CP. The division TAC CP concentrates on the C2 of the current close fight. The focus of engineer functions in the TAC CP is to provide the ADC-M and the division engineer with information about the engineer close current fight that is needed for making timely decisions. Engineer representatives in the TAC CP–

- Track friendly and enemy obstacles.
- Coordinate the execution of the division's scheme of engineer operations in the close fight.
- Synchronize the unity of engineer effort among maneuver brigades.
- Provide engineer expertise to the ADC-M.
- Receive, post, and analyze combat intelligence affecting current engineer operations and provide input to the current IPB.
- Receive, post, analyze, and forward reports on current engineer operations from maneuver brigades in the close fight.
- Provide engineer expertise to the TAC fire-support element.

As part of the parallel planning process, the TAC CP engineer closely monitors FRAGOs from corps and guidance given by the division commander for the future fight. Based on the commander's guidance, the TAC CP forwards engineer guidance to engineer planners in the main CP. The TAC CP engineer also assists the division engineer in identifying critical engineer events, engineer tasks, and resource requirements for the future close fight by maintaining an accurate status of engineer operations in the close fight.

Main CP

Functions of the Main CP. The nucleus of the division C2 organization is the main CP. The main CP is designed to provide the division with the capability of "seeing the total battlefield" in the current fight while simultaneously planning for future fights. For the current fight, the main CP prepares and issues FRAGOs, develops sequels and

branches for current fights, and coordinates the allocation of resources and establishment of priorities. The main CP sees the battle through reports from the TAC CP, rear CP, and subordinate units. The majority of the information arriving at the main CP is normally historical and insufficient to make timely, tactical maneuver decisions. Therefore, the role of the main CP in the current fight is to respond to requests for immediate support by the TAC and rear CPs. The main CP also ensures that decisions made by the TAC and rear CPs are rapidly coordinated and effectively conducted. The main CP must also be prepared to control the close fight if the TAC CP is unable to do so. The main CP controls the conduct of the deep light in coordination with the TAC CP to ensure synchronization with the close fight. The main CP also monitors the operations of higher and flank units and provides the information to the TAC and rear CPs.

The main CP is the central C2 node for planning future deep, close, and rear fights. It has three functional cells: the command cell, the G3 cell, and the G2 cell. The command cell contains and is responsible for the command center vehicle and the division commander's command group. The G3 cell contains the G3 operations, plans, engineer, fire-support, air defense artillery, aviation brigade, airspace command and control (A2C2), assistant division signal officer (ADSO), and nuclear, biological, chemical NBC elements. The G2 cell contains the G2 operations, all-source production section (ASPS), weather, and topographic elements.

Engineer Functions in the Main CP. In concert with its role as the nucleus of division C2, the main CP is also the center of gravity for all engineer functional planning. The division engineer's principal representative in the main CP is the ADE. The major engineer functions are–

- Tracking all mobility, countermobility, survivability, and sustainment and topographic engineering aspects of current deep, close, and rear fights.
- Receiving, posting, and analyzing terrain, enemy engineer, and other intelligence and participating in the IPB for future plans.
- Identifying engineer resources required to support deep, close, and rear fights for future plans.
- Developing the division's scheme of engineer operations to support all courses of action for future plans.
- Processing requirements received from the TAC and rear CPs and integrating them into future plans.
- Synchronizing and integrating engineer plans with future division plans.
- Preparing engineer input for division operation plans (OPLANs) and OPORDs.
- Coordinating and transferring information with adjacent division engineers and the corps engineer.

The ADE must conduct close coordination both internal and external to the main CP. The ADE relies heavily on reports from the TAC and rear CP engineers and the DIVEN MAIN CP. He also closely coordinates with the G2 cell and the G3 plans, operations, and fire-support elements to see the total battle and integrate into future plans.

The ADE assists the G3 operations element in synchronizing engineer operations in the current close and rear battles and in responding to immediate engineer tactical requirements. As the current fight develops, the TAC CP receives requests for immediate support from the maneuver brigades. The ADC-M makes decisions, issues FRAGOs to the brigades, and forwards his decisions to the main CP for coordination. When those decisions involve engineer operations or

forces, the TAC CP engineer ensures the decision and requirements are passed to the main CP. The ADE works closely with the operations element to completely resource and synchronize the decision to support the current fight. The main CP also receives requests for immediate tactical support from the division rear CP. The assistant division commander for support (ADC-S) makes decisions for adjustments to the current rear fight. Likewise, when these requests involve adjustments to the scheme of engineer rear operations, the rear CP engineer ensures that the requirements are forwarded to the main CP for coordination by the ADE.

The ADE tracks intelligence reports from corps, the TAC and rear CPs, and the DIVEN MAIN and identifies information essential to engineer operations. The ADE uses this information to participate in the IPB as well as to refine or develop the engineer estimate for the current and future fights. The ADE must also ensure the information is passed to the TAC and rear CP engineers as well as the DIVEN MAIN.

The ADE monitors current engineer operations and coordinates with adjacent and higher engineer headquarters. He maintains the necessary data base to pass critical engineer information to adjacent or relieving units, as required. He also requests and receives engineer information requirements from adjacent and higher organizations. Figure 2-2 illustrates the functional control concept for the current fight.

The ADE works with the G3 plans element of the main CP in developing future plans,

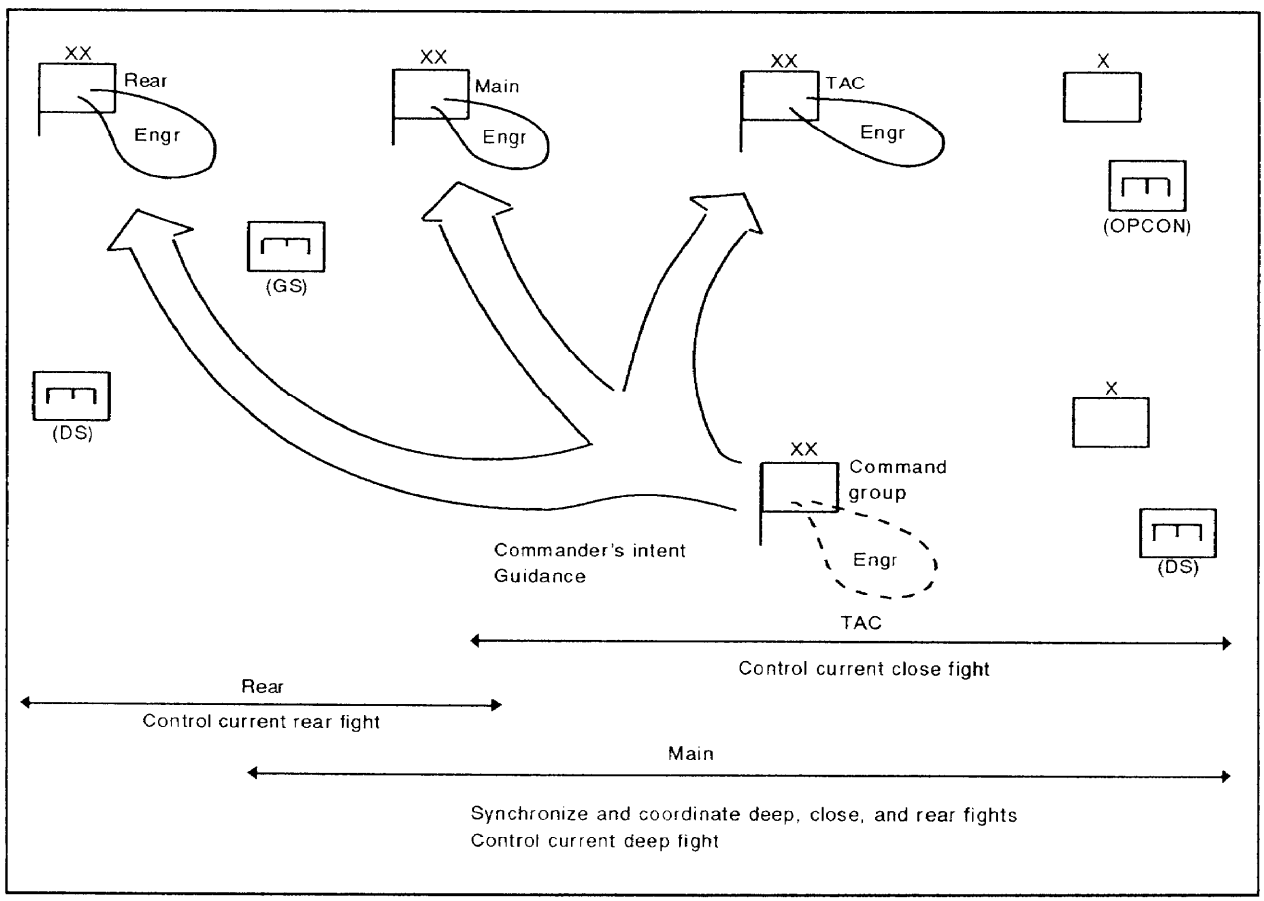


Figure 2-2. Functional control: current

integrating engineer operations to support the future fight, and allocating the necessary engineer forces. When the division receives a FRAGO, the ADE assists the plans element in processing the order and gathering the information necessary for future planning.

Just as the plans element receives guidance on the future fight from the command group, the ADE receives engineer guidance from the division engineer. The ADE develops the scheme of engineer operations for courses of action developed by the plans element. In developing the scheme of engineer operations, the ADE considers the engineer requirements to support all aspects of the future fights (deep, close, and rear). The ADE works closely with the plans element in identifying critical engineer missions, allocating the necessary engineer forces, and recommending an engineer task organization. The ADE prepares engineer input to the division base OPORD, OPLAN, or FRAGO and prepares the engineer annex, where required. To facilitate parallel planning, the ADE coordinates with the TAC and rear CP engineers and the DIVEN MAIN as the plan develops. Figure 2-3 illustrates the functional control concept for the future fight.

Rear CP

Functions of the Rear CP. The rear CP focuses on the C2 of all elements located within the division's rear and synchronizes the rear fight for the division. Because the rear CP is not manned or equipped to conduct the current fight and to plan for future

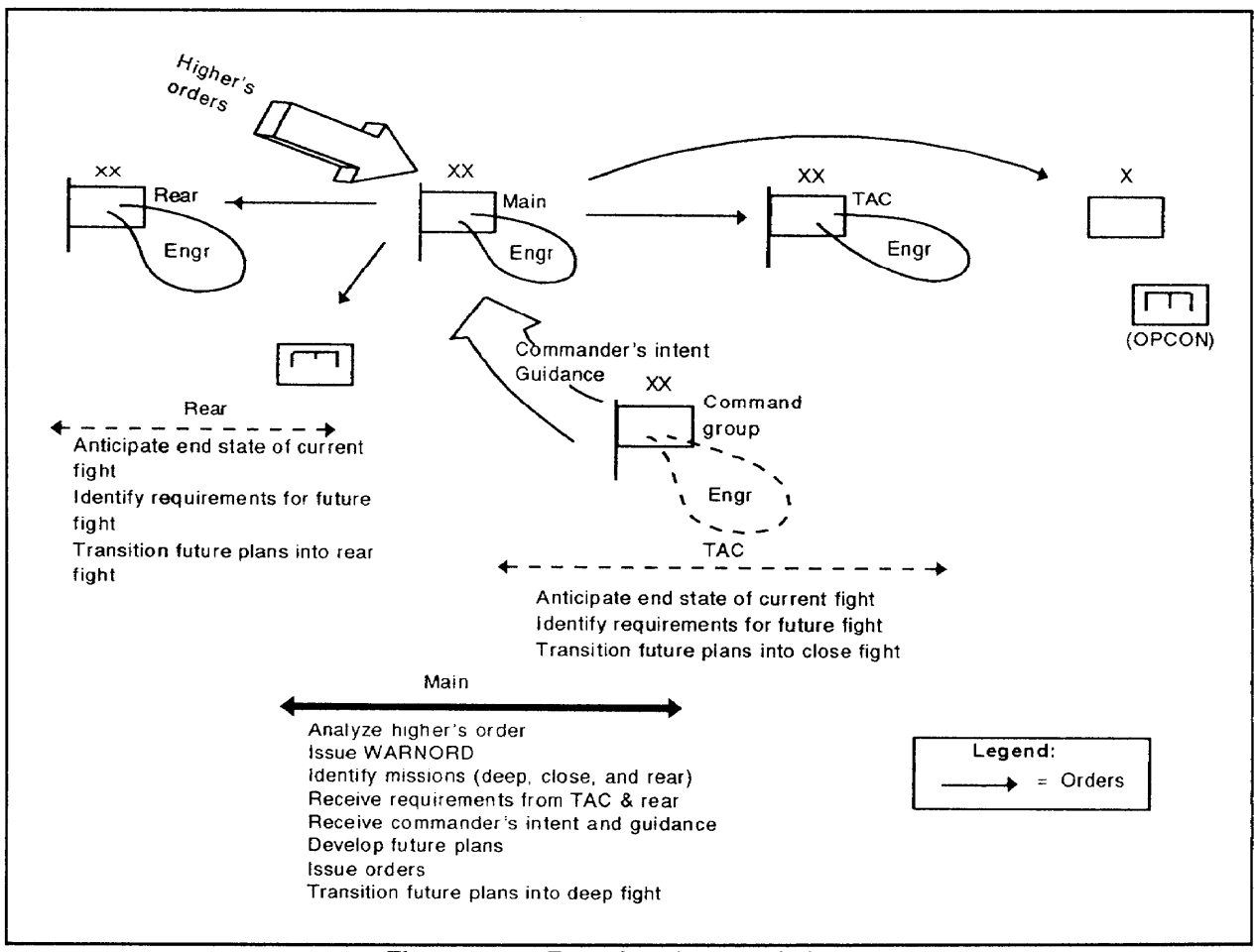


Figure 2-3. Functional control: future

rear fights simultaneously, it is only an extension of the main CP. The rear CP normally collocates with the division support command (DISCOM) CP within the division support area (DSA). The ADC-S is normally in charge of the rear CP.

The rear CP's primary role in the division C2 organization is to ensure that the rear fight is synchronized and integrated with the close and deep fights. The rear CP monitors the status of rear area combat and sustainment operations. Units operating in the rear CP area provide operational and unit status reports to the rear CP. The rear CP deconflicts unit movements within the division rear area where needed and controls them when required. The status of the rear fight and units is reported to the main CP. This information is vital to the main CP's development of future plans.

The rear and DISCOM CPs jointly analyze future division plans for their impact on current and future rear fight. This enables them to ensure that the necessary sustainment support is available. The rear CP is also responsible for planning, coordinating, and synchronizing rear security. It assigns units to bases or base clusters and appoints commanders for each. The rear CP also controls the tactical combat force and integrates it into the rear defensive plan. The rear CP monitors activities in the brigade rear areas, the adjacent division rear areas, and the corps rear area to prevent potential conflicts. Lastly, the rear CP may assume control of the current close fight, if augmented, when the main and TAC CPs can no longer function.

Engineer Functions in the Rear CP. The rear CP normally requires engineer staff support due to the diversified engineer battlefield functions that occur in the division's rear area. Those functions include–

- Providing engineer advice to the ADC-S.
- Making recommendations on engineer requirements to support base and base cluster defenses.
- Identifying engineer requirements for sustainment engineering, terrain management, movement control, and force protection.
- Preparing to assume the duties of the ADE if the rear CP assumes the main CP's mission.
- Controlling rear engineer operations for the ADC-S.
- Receiving, analyzing, and posting information on current engineer operations in the rear area and ensuring engineer reports are forwarded to the main CP.
- Coordinating logistics operations for engineers operating in the division rear.

The rear CP engineer provides the ADC-S with the engineer expertise he needs to plan, execute, and synchronize the division rear fight. He also provides the ADC-S with the information and expertise he needs to make immediate tactical decisions on the current rear fight. When his decisions involve engineer operations in the rear area, the rear CP engineer recommends the necessary adjustments in engineer support.

The rear CP engineer also assists the rear CP in analyzing future plans to ensure that the necessary sustainment support is available for the future fight. Specifically, the rear CP engineer looks at the engineer missions required in the rear area to sustain the division. The rear CP engineer also provides the rear CP with countermobility, survivability, and force protection expertise in planning base and base cluster defenses. The rear CP engineer identifies the resource requirements for future sustainment engineering, base cluster defenses, and force protection to the ADE. Furthermore, the rear CP engineer identifies engineer logistics

issues for the DISCOM and rear CPs that affect the ability of engineer units to perform missions in the future fight.

Finally, the rear CP engineer assists the rear CP in tracking all aspects of the current fight in the event it has to assume control of the battle. Therefore, the rear CP engineer must maintain situation maps and track critical engineer information parallel with that of the ADE and the DIVEN MAIN so that he can assume the duties of the ADE, if required.

ENGINEER C2 ORGANIZATION

The DIVEN commander provides C2 for his subordinate units. This requirement is the same in all types of divisions. The DIVEN organization C2 structure and its location on the battlefield are determined by the–

- Diversity of the engineer battlefield functions required.
- Current mission.
- Division's C2 structure.
- Location of subordinate units on the battlefield.
- Task organization and command-and-support relationships of subordinate units.
- Logistics requirements of subordinate units.

To accomplish his unit C2 responsibilities, the DIVEN commander establishes a basic C2 structure consisting of a command group and three CPs: the DIVEN MAIN, the DIVEN TAC, and the DIVEN REAR. The DIVEN commander adjusts the organization, personnel, procedures, and equipment of his C2 structure based on his own METT-T analysis of each mission. The foundation of the functions and operations of the command group and CPs is contained in FM 101-5.

DIVEN Command Group. The command group consists of the DIVEN and designated members of his staff. The command group's location, exact composition, and span of control are mission dependent. Their focus remains on the C2 of the current fight. The DIVEN commander uses his command group to influence the fight through the personal leadership of each member. They provide command presence at critical locations on the battlefield and should have the authority to make timely decisions on behalf of the DIVEN commander.

DIVEN TAC. The DIVEN TAC, when deployed, is the forward-most engineer CP. Its functions include–

- Assisting the DIVEN commander in commanding and controlling his subordinate units supporting the close fight.
- Providing information about the close fight to the DIVEN MAIN.
- Assisting the division TAC CP engineer, when required.

The DIVEN TAC will normally be deployed when the DIVEN commander needs to exert greater forward C2 on subordinate units to support missions such as river-crossing operations, large-scale breach operations, relief-in-place missions, and the execution of preplanned obstacles prior to the deployment of maneuver forces. The DIVEN TAC may also deploy when the required engineer functions at the division TAC CP exceed the capability of the TAC CP engineer to perform them. The DIVEN TAC must maintain

communications with the DIVEN MAIN and the division TAC CP engineer. It must be capable of conducting continuous operations.

DIVEN MAIN. The DIVEN MAIN is the center of engineer unit synchronization of the current deep, close, and rear fights and planning for future fights. It provides the DIVEN commander with the ability to see the entire battlefield. The functions of the DIVEN MAIN include–

- Commanding and controlling all subordinate units.
- Developing intelligence.
- Tracking the current battle.
- Collating information for the commander.
- Coordinating support for subordinate units.
- Providing reports to the division.
- Planning the future fight.
- Developing and issuing engineer unit orders.
- Assisting the ADE when required.

The DIVEN MAIN is normally located close to the division main CP to facilitate coordination and communication with the division and to support the ADE when the required engineer functions at the division main CP exceed the capability of the ADE to perform them. The DIVEN MAIN must also maintain communications with the DIVEN command group, DIVEN TAC, DIVEN REAR, and the ADE. The DIVEN MAIN exercises C2 of the current fight when the DIVEN TAC is not deployed. It must be capable of conducting continuous operations.

DIVEN REAR. The DIVEN REAR is located close to the division rear and DISCOM CPs in the division's rear area. Its functions include–

- Commanding and controlling subordinate units supporting the rear fight, as required by the DIVEN commander.
- Coordinating CSS for the DIVEN organization.
- Acting as the alternate DIVEN MAIN CP.
- Assisting the division REAR CP engineer, when required.

The DIVEN REAR may be formed from DIVEN organization assets, a supporting corps engineer unit headquarters, or a combination of both. The DIVEN REAR must maintain communications with the DIVEN MAIN and the division rear CP engineer. The DIVEN REAR may also assist the division rear CP engineer when the required engineer functions at the division rear CP exceed his capability to perform them. It must also be capable of continuous operations (Figure 2-4, page 2-12).

ENGINEER PLANNING PROCESS

The engineer estimate process is the primary tool for facilitating engineer planning. The engineer estimate enables early integration of engineer battlefield functions into the division's combined arms plan. The process enables the timely development of necessary engineer instructions to maneuver forces through the division order and to division and supporting corps engineer units through engineer orders.

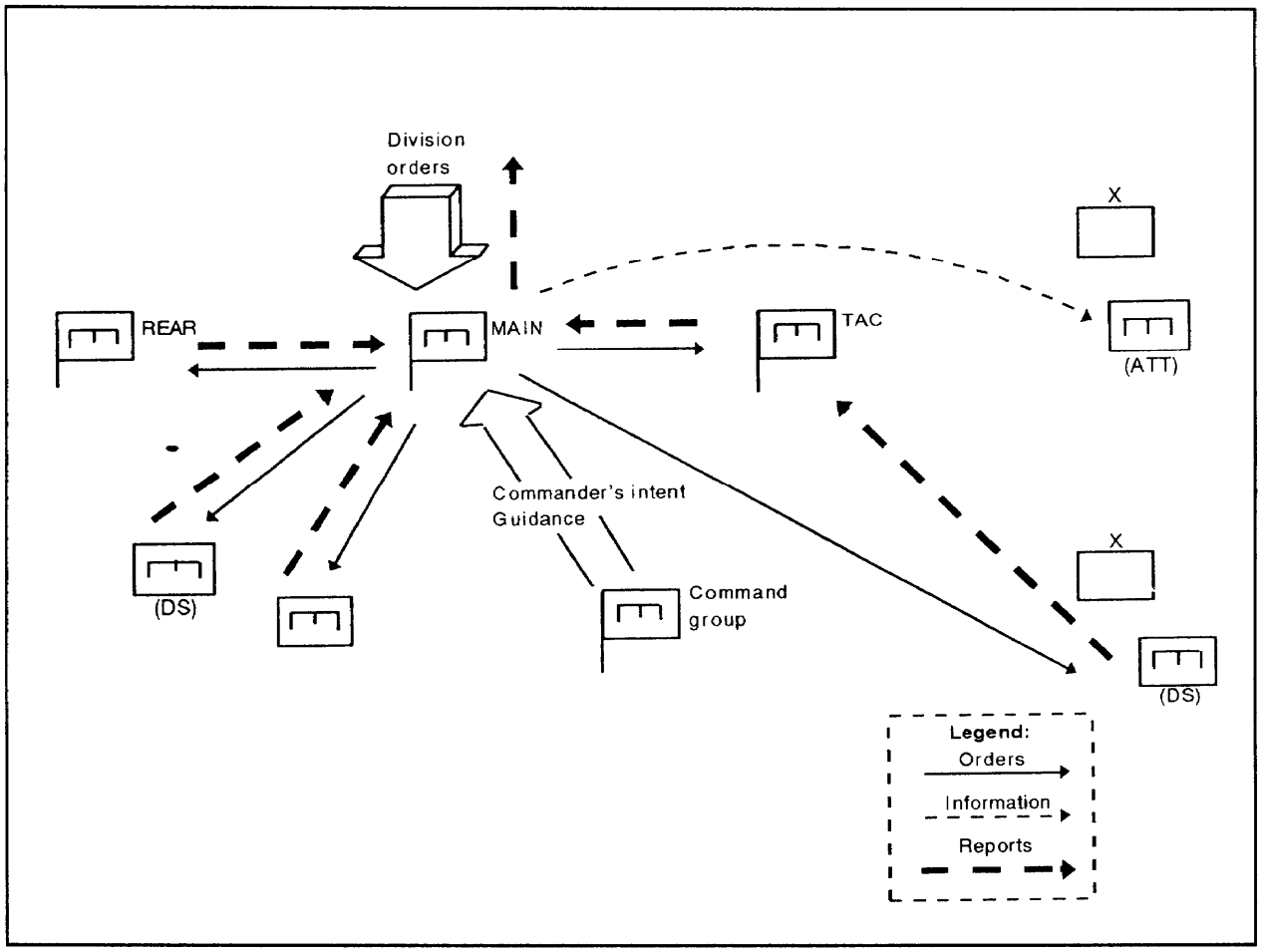


Figure 2-4. Unit C2

The nature of engineer support requires integration with the combined arms team beginning at the outset of division planning. The tactical decision-making process is the framework used to focus the efforts of the division commander and his principal staff as they plan and conduct tactical combat operations. The engineer estimate process is simply an engineer extension of the tactical decision-making process.

The steps of the tactical decision-making process and engineer estimates complement one another. Figure 2-5 illustrates how the steps of the engineer estimate are an extension of the tactical decision-making process. The arrows show steps which have two-way input and steps where the command estimate dominates the development of engineer plans. The division engineer must understand all aspects of the division plan. In particular, he must thoroughly understand the commander's intent and concept for maneuver, engineers, and fire support. While the engineer estimate process outlines specific steps, it is in no way lockstep. More importantly, it is a continuous process with each step or consideration refined based on changes in the current situation and future mission. Appendix A contains a more detailed discussion of the engineer estimate.

As a result of the engineer estimate, the division engineer ensures that the necessary engineer missions and instructions are included in the appropriate part of the division order. Engineer information and instructions are not simply consolidated in the

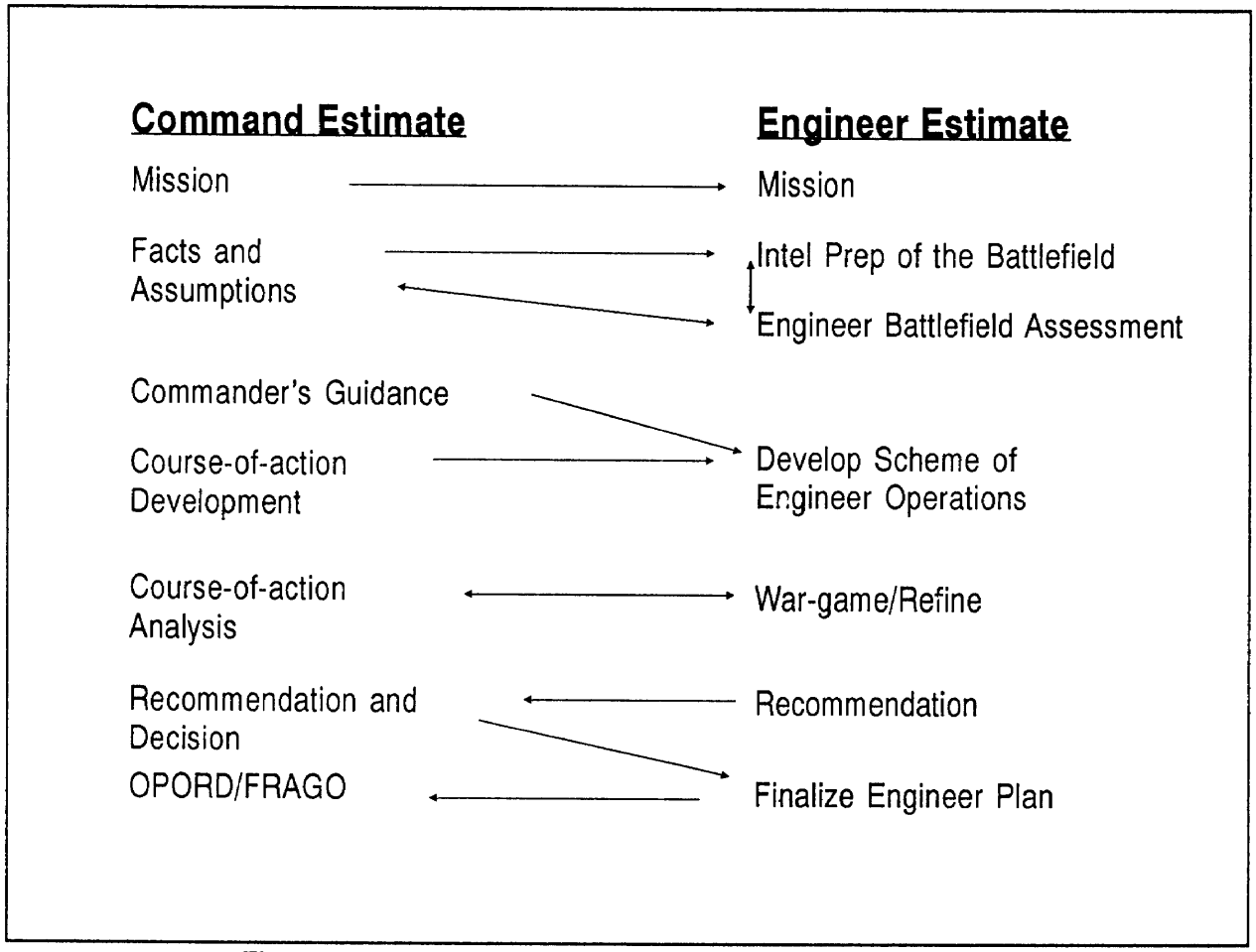


Figure 2-5. Tactical decision-making and engineer estimate

engineer annex; this tends to obscure critical information and instructions from the maneuver brigade commanders. For example, if reducing and marking eight breach lanes through a beachhead is critical to the division plan, it may appear as a specified task to the breaching brigade. Likewise, the enemy's recent integration of scatterable mines in his preattack fires may be included in the enemy situation of a FRAGO. The scheme of engineer operations is another example of engineer information contained in the base division order. It describes the general concept for engineer support to the division fight, usually concentrating on the close battle. The engineer estimate helps the planner identify critical engineer information and mission-essential tasks for inclusion in the basic order. Table 2-1, page 2-14, illustrates how key components of the engineer estimate process drive engineer input into the division basic order.

Engineer Annex

At division level, most OPLANs, OPORDs, and detailed FRAGOs will include an engineer annex. The engineer annex conveys critical engineer information and engineer-specific instructions that are either too voluminous or not appropriate for inclusion in the basic order. The annex may take the form of written instructions, matrices, overlays, or a combination. Appendix B discusses the format and content of the engineer

Table 2-1. Engineer input into the division OPORD

ENGINEER ESTIMATE	INPUT	OPORD PARAGRAPH
IPB/EBA	Critical aspects of the terrain and enemy engineer activity impacting on the maneuver plan	1. SITUATION a. ENEMY INTEL ANNEX
MISSION ANALYSIS	Mission-essential M/S tasks assigned to maneuver units or separate engineers	3. EXECUTION e. SUBUNIT MISSIONS - MANEUVER - ENGINEER
DEVELOP SCHEME OF ENGINEER OPERATIONS	Concept of engineer operations to support division plan	3. EXECUTION d. SCHEME OF ENGINEER OPERATIONS
	Task organization of engineer forces and command/support relationships	TASK ORGANIZATION
	Allocation of M/S mission resources to maneuver units	4. SERVICE SUPPORT
	Graphic control measures needed for obstacle control, river-crossing, and large-scale breaching operations	OVERLAYS: OPERATIONS ENGINEER CSS
WAR-GAME AND REFINE	Additional coordinating instructions to maneuver units needed to synchronize engineer effort	3. EXECUTION f. COORDINATING INSTRUCTIONS
RECOMMEND COURSE OF ACTION	None	None

CONTINUOUS

FINALIZE ENGINEER PLAN

annex in more detail and provides sample matrices and overlays. Table 2-2 illustrates how the content of the engineer annex is derived from the engineer estimate process.

Orders

All commanders issue timely, clear, and concise orders to give purpose and direction to subordinate planning, preparation, and execution. DIVEN commanders issue orders to all subordinate engineer units, as necessary, to execute the scheme of engineer operations for the division close and rear fights. Orders transform the division scheme of engineer operations into clear, concise engineer missions. They combine the concept of engineer support with the engineer unit-specific plans needed to accomplish engineer missions and sustain the engineer force. In short, they bind the entire engineer plan together and ensure unity of the engineer effort.

The DIVEN commander uses his unit orders to command engineer forces remaining under his control for the fight. These unit orders may prescribe engineer missions in the close and rear battle. However, the bulk of engineer missions in the close battle are conducted by engineers supporting the maneuver brigades and are executed through functional control of the maneuver brigades. These missions may be assigned as tasks in the division order and annexes. Regardless of the command-and-support relationship, the division engineer must still provide the division commander with functional control over the engineer effort within the brigades and battalions to ensure unity of effort.

The DIVEN commander uses the combination of division and engineer unit orders to exercise the appropriate level of command versus engineer functional control. The DIVEN commander exercises a high level of

Table 2-2. Engineer annex content and engineer estimate

ENGINEER ANNEX FORMAT	CONTENT	ENGINEER ESTIMATE
TASK ORGANIZATION	Task organization of engineer units, includes who they support and in what command/support relationship	SCHEME OF ENGINEER OPERATIONS - FORCE ALLOCATION - TASK ORGANIZATION
1. SITUATION a. ENEMY	Aspects of the weather, terrain, and enemy M/S activities that significantly impact on engineer missions	INTEL PREPARATION OF THE BATTLEFIELD
b. FRIENDLY	Identify missions and plans of higher and adjacent engineers that impact on the plan	ENGINEER BATTLEFIELD ASSESSMENT - TERRAIN - ENEMY M/S CAPABILITY
c. ATTACH/DETACH	Clarify changes in task organization that occur during the execution	HIGHER'S OPORD AND ENGINEER ANNEX
2. MISSION	Mission statement of supported unit	RESTATED MISSION FROM SUPPORTED UNIT
3. EXECUTION a. SCHEME OF ENGINEER OPERATIONS	Concept of the engineer operations to support maneuver plan	SCHEME OF ENGINEER OPERATIONS
b. OBSTACLES c. SCATTERABLE MINES	Details on use of obstacles and scatterable mines	SCHEME OF ENGINEER OPERATIONS
d. SUBUNIT MISSIONS	Missions to engineer units - task organized to brigades - under division troops	MISSION ANALYSIS
e. COORDINATING INSTRUCTIONS	Instructions common to two or more engineer units	WAR-GAME AND REFINE
4. SERVICE SUPPORT a. COMMAND-REGULATED SUPPLIES b. EFSP LOCATIONS c. TRANSPORTATION d. MEDICAL e. HOST NATION	Identify allocation of M/S mission resources Method of mission sustainment Method of unit sustainment	SCHEME OF ENGINEER OPERATIONS - ALLOCATE RESOURCES FINALIZE THE ENGINEER PLAN
5. COMMAND AND SIGNAL	Location of engineer CPs Special command and control arrangements Required reports	FINALIZE THE ENGINEER PLAN

both unit and functional control over organic and supporting corps engineers not task organized to the maneuver brigades. He directly issues these forces the full range of unit orders. The DIVEN commander exercises limited unit control over task-organized engineer forces but, as the division engineer, is still responsible for their functional control. He issues task-organized units DIVEN unit warning orders (WARNORDs) to focus subordinate planning and preparation. The bulk of engineer instructions to engineers supporting the brigades is contained in the division engineer annex.

Engineer Unit Orders

Engineer unit orders are essential to ensuring that subordinate units understand how their missions support the maneuver plan and mesh with the total engineer plan for the division. DIVEN commanders use WARNORDs, OPORDs, and FRAGOs to convey their orders to subordinate units.

WARNORDs. The DIVEN commander issues a WARNORD to his subordinates when a FRAGO is received from division or when he perceives significant changes to the plan. The WARNORD is essential to initiating

subordinate planning and preparation. It should be as detailed as possible, based on the mission and information available. For engineers in particular, it should include any likely changes in task organization. This facilitates planning any consolidation of forces and required sustainment operations. Appendix B provides the format for a WARNORD and gives examples.

OPLANs and OPORDs. The DIVEN commander issues an OPLAN or OPORD at the outset of an operation or when the division mission changes so much that the initial OPLAN or OPORD is no longer useful as a foundation. The engineer estimate process and tactical decision-making process again drives the development of engineer unit orders.

Initial OPORDs focus the engineer force on the mission, effect the necessary task organization, assign unit missions (including "on order" and "be prepared" missions), and establish the necessary service support structure. They also provide subordinate commanders with the DIVEN commander's intent and scheme of engineer operations. A clear commander's intent and concept of the operation gives subordinate engineers the combination of freedom of action and unity of effort. Subordinate engineer commanders must have the freedom to tailor their plans to the needs of their supported commander. At the same time, their efforts must complement the total engineer plan. Appendix B outlines the OPORD format and content and provides some examples. The DIVEN commander uses his initial OPORD as a base plan from which he can adjust as the situation develops. However, when the division mission changes drastically and the initial order is no longer a solid base, the DIVEN staff conducts a more deliberate planning process. A new unit OPORD is developed and issued to subordinate engineer units.

FRAGOs. The last type of order is the FRAGO. A FRAGO does not have a set format or content; it is modified to meet the needs of the situation. The FRAGO allows the DIVEN commander to quickly modify the current OPORD for his subordinate units based on changes in the situation. The FRAGO outlines changes only; all other instructions in the base OPORD remain in effect. Normally, the DIVEN commander uses the FRAGO when there is an immediate tactical requirement to adjust engineer task organization, scheme of engineer operations, or subunit missions. However, the FRAGO can be used to change any part of the base OPORD. As with any order, the receiving unit uses the FRAGO as a basis for initiating planning. Engineer units in a direct-support relationship do not execute the FRAGO until the supported commander has received a FRAGO from the division changing the division order. Engineer units in a command relationship receive their FRAGOs from their supported unit. Appendix B provides general guidelines on FRAGO format and content and gives an example.

Engineer units that are attached to another headquarters will not normally be addressed in engineer unit orders except in the attached and detached section. Engineer units that are under the OPCON of another headquarters are addressed in attachments and detachments and receive service and support instructions. In both of these cases, the staff engineer should receive an information copy of the DIVEN unit order to assist in developing the engineer plan for his supported unit. Engineer units under DIVEN command, including those task organized to another unit in a support relationship, are issued a full order.

Chapter 3

Offensive Operations

The primary purpose of the offense is to destroy the enemy and his ability and will to resist. Offensive operations are designed to defeat the integrity of the enemy's defense system by driving into his rear and destroying artillery, reserves, C2 systems, CPs, and logistics support. Offensive operations may also be conducted to secure key or decisive terrain, deceive or misdirect uncommitted enemy forces, fix or isolate units, gain information, or spoil an enemy's offensive preparation. Divisions are normally tasked to conduct offensive operations as part of corps offensive or defensive operations. However, a division may conduct an offensive operation independently as a contingence force or internally as part of its own offensive or defensive operation.

This chapter provides a doctrinal foundation for division engineer support to offensive operations. It serves as an engineer extension of FM 71-100, Chapter 4. It examines how division engineers, regardless of the type of division, fit into the offensive framework and assist the division in achieving successful offensive operations. Understanding how division engineers fit into the division framework is prerequisite to effective offensive engineer planning. The engineer estimate process remains a useful tool but must be focused to meet the needs of division offensive planning.

While the role of division engineers in the offensive framework and the focus of engineer planning are the same for both armored and light forces, their tactical employment is distinctly different. In short, armored and light divisions fight differently. Each type of division is designed to have specific capabilities on the battlefield; however each also has inherent limitations. As a result, each type of division applies the basic forms of maneuver and conducts the five types of offensive operations to maximize the division's capability and minimize its limitations. These tactics are unique to the type of division and demand a correspondting unique employment of division engineers. Moreover the engineer force structure in armored and light divisions is different, with diversified capabilities and limitations. Therefore, separate sections of this chapter are dedicated to the foundations of engineer employment for armored and light division engineers in support of offensive operations.

OFFENSIVE CHARACTERISTICS

The offensive operation is the division's primary means of gaining and maintaining the initiative. Successful engineer support of the division attack depends on the division engineer's understanding and application of five offensive characteristics: concentration, surprise, speed, flexibility, and audacity.

Concentration is achieved by massing combat power at the point of attack. The division engineer must task organize and develop a scheme of engineer operations that masses the right type of engineer support at the right place and time and supports the massing of maneuver forces. The

engineer task organization must provide the most responsive support at the point of attack.

The division achieves surprise by attacking where the enemy least expects. To give the division the element of surprise, division engineers overcome existing and reinforcing obstacles rapidly and provide the division with mobility over restrictive terrain. Engineer speed and flexibility in support of the division are critical to the attack. Speed and flexibility are required to take advantage of enemy weaknesses, exploit success, and maintain the ability to shift the main effort rapidly. They are achieved by both a responsive engineer C2 system and a responsive decision cycle. Finally, the division engineer facilitates offensive audacity by seeing the battle and anticipating future engineer requirements. He must constantly posture the engineer force so that the division can rapidly take advantage of narrow windows of opportunity.

DIVISION OFFENSIVE FRAMEWORK

The division engineer must understand the division offensive framework to integrate effectively into offensive operations as both engineer planner and unit commander. In planning and conducting the offense, the division concentrates on the offensive battlefield framework–deep, close, rear, security, and reserve. Division engineer planners, commanders, and units each have a role in these five components. Understanding how division engineers support the division offensive framework is imperative to effective integration.

Deep Operations

The purpose of division deep operations is to create the conditions required for successful close operations. Deep operations are conducted to destroy uncommitted forces that could influence the outcome of the close fight. The division deep battle initially focuses on interdicting enemy division reserves, then shifts to enemy forces defending in subsequent objectives (future fights) as the close operation moves forward. The primary means for conducting division deep operations are field artillery (FA), attack helicopters, battlefield air interdiction (BAI), and electronic warfare (EW). However, the division may also use ground-maneuver units or dismounted infantry task organized for air assault operations. The division uses these assets to target enemy artillery, counterattack forces, C2 nodes, air defense artillery (ADA), and sustainment operations.

Division engineers contribute to all facets of deep operations as both planners and units. For example, the division engineer may plan for the use of the Gator or air-delivered Volcano as part of a division joint air attack team (JAAT) against enemy reserves or counterattack forces. When the focus of the deep operation is against enemy sustainment activities, the division engineer works with the G2 to identify and nominate enemy engineer logistic sites as priority targets. Division engineer units are task organized to dismounted infantry or ground-maneuver units committed to division deep attacks to provide the force with the necessary engineer support.

Engineer support to deep operations requires aggressively working the intelligence system and synchronizing current deep operations with the future close battle. The division engineer must continuously assess the engineer needs of division deep operations. He works closely with the G2 cell in identifying information requirements needed to plan, resource, and synchronize engineer support to deep operations. The process is continuous. As the close and deep battles move forward, the engineer

must continue to refine his intelligence-collection requirements. Likewise, the engineer must analyze how the success or failure of deep engineer operations impacts on the future close operation.

Close Operations

In the offense, division close operations focus on penetrating a defending regiment, fixing enemy forces adjacent to the main effort, and committing brigades to exploit success. Supporting the close operation is the focus of division engineer effort. In general, division engineers are task organized to mass mobility assets in the lead brigades of the division main effort. Division engineers are also task organized to provide the necessary mobility and countermobility to supporting attacks that must penetrate and fix adjacent enemy forces. Mobility for the exploiting brigades is provided by both corps and division engineers. Corps engineer units upgrade breach lanes for forward passage of exploiting brigades. Division engineers are task organized to the exploiting brigades to maintain mobility support forward.

Deception operations play an important role in the close operation. The division uses deception to target enemy regimental or division commanders, causing them to divert combat power away from the friendly main attack. The division engineer participates in planning deception operations by identifying engineer requirements needed to support the overall deception plan. He must also identify, up front, the impact that committing engineer resources to the deception has on support to the main effort. For example, the division may use a demonstration to cause the enemy commander to position his reserve away from the friendly main effort. The deception picture may not be complete without a supporting show of engineer force. However, the division engineer must consider the impact that dedicating engineer forces to the demonstration has on the main effort.

Close operations normally consist of main and supporting attacks. The main attack seizes the division's primary objective or destroys the division's assigned enemy force. It is characterized by mass concentrations of fire supported by dedicated CS and CSS to make rapid, bold, decisive advances.

The main effort of division engineers is to provide dedicated engineer support to the division main attack. The engineers supporting the main attack must remain focused until the mission is accomplished. The division engineer maintains this focus of engineers with the main effort by tasking them with mission-essential, division-level tasks only. The division engineer uses uncommitted engineers under division control to accomplish other engineer missions. In close operations, the fight is directed and controlled by the attacking brigades using direct and indirect fires and maneuver to defeat defending enemy battalions. Engineers committed to the main attack are normally attached to maneuver brigades for the duration of the mission to give the brigade commander the most responsive support possible.

The supporting attack exists only to assist the main attack. The mission of the supporting attack is limited in scope. It may be to deceive the enemy, seize critical terrain, fix adjacent enemy forces, or prevent enemy disengagement. Although the supporting attack usually receives fewer resources than the main attack, its success or failure may determine the success of the main attack. Therefore, commanders and their staffs must understand the link between main and supporting attacks.

The division engineer cannot ignore the engineer needs of the supporting attack. Again, he must consider how the supporting attack assists the main effort and identify the critical engineer tasks necessary to render that assistance. While the supporting attack is not normally the main effort of engineer support, certain essential

engineer missions may receive priority resourcing. For example, the division may task its supporting attack to fix an enemy counterattack force in position before it can be committed against the main effort. Engineers committed to the supporting attack, in this case, may be task organized with the bulk of the division's ground Volcano, taking away some flexibility from the main effort.

Flexibility is a key component of successful close operations. The division develops contingency plans that enable it to shift from one type of offensive mission to another. The division also plans contingencies for shifting forces and the main effort between brigades. Therefore, division engineers must be sensitive to the contingency plans of the division and anticipate engineer requirements. The division engineer should plan for the improvement of routes between brigades to facilitate the lateral shifts in combat power. In addition, he must develop their own contingency plans for shifting critical engineer assets between brigades as the main effort or mission changes.

The division also uses follow-and-support forces to accomplish missions that would otherwise divert forces away from the division main effort. A follow-and-support force is not the same as a reserve. It is a committed force with specific missions and is task organized with appropriate combat, CS, and CSS forces. Some potential follow-and-support missions are to widen or secure a penetration, secure key terrain, open LOCs, control refugees or prisoners, destroy bypassed enemy units, and attack counterattacking forces.

The division engineer must understand the division commander's intent for the use of follow-and-support forces. The division engineer analyzes the engineer tasks inherent in the possible missions assigned to the follow-and-support force and task organizes engineer support accordingly. Depending on his mission analysis, he may allocate organic or supporting corps engineer forces to accomplish follow-and-support engineer missions. Again, he must guard against allocating engineer forces to follow- and-support missions at undue expense to the main effort.

Reconnaissance and Security Operations

Reconnaissance and security operations are essential to the success of division offensive operations. Reconnaissance is used to confirm or deny critical assumptions made about the terrain and enemy situation. Aggressive reconnaissance is critical to identifying and guiding attacking forces to an enemy weakness. The information is useless, however, if it is not rapidly evaluated, interpreted, and disseminated to the attacking brigades.

Engineers assist in reconnaissance in multiple roles. The division engineer must work closely with the division staff to integrate engineer information requirements into the total intelligence-collection effort. While engineer unit participation in combined arms reconnaissance is primarily at the task force level, their efforts are largely focused by the information requirements (IR) and PIR coordinated at division and brigade. The division engineer assists the G2 cell in interpreting and analyzing intelligence. He assists the division commander and his staff in analyzing the impact engineer intelligence has on current and future operations. Engineers must make maximum use of engineer channels to forward combat intelligence to higher headquarters and pass analysis to subordinates.

The purpose of division offensive security operations is to guard against unexpected interference by enemy forces. The division secures its flanks and rear by screen and guard forces. The division engineer assists the G2 in identifying likely mobility corridors and avenues of approach that threaten the division's flanks and rear.He analyzes the threat and makes recommendations on the use of situational obstacles to assist guard and screening forces in its security mission.

Reserve Operations

The division creates a reserve force to maintain the momentum of the attack by exploiting success, defeating counterattacks, providing security, or weighting the main effort. The division reserve is not a committed force; it has multiple be prepared missions which are executed on the decision of the division commander. The plan does not depend on the commitment of the reserve to accomplish the mission. The size and composition of the reserve are completely METT-T dependent.

The division engineer must understand all of the be prepared missions of the division reserve and analyze the engineer tasks involved. In the offense, engineers with the reserves are essential. To exploit success and maintain the tempo of the attack, the division commander must be able to commit his reserve with all CS and CSS intact. The commitment of the reserve must not be delayed by changes in engineer task organization necessary to accomplish its mission. The engineer tasks involved in reserve operations missions are essentially the same as the attacking brigades.

Rear Operations

Engineers also play an important role in rear operations. The purpose of division rear operations is to retain the division's freedom of maneuver and continuity of operations. Rear operations involve synchronizing and protecting division sustainment operations to support the attacking brigades. Engineers support rear operations by constructing, maintaining, or improving LOCs necessary to sustain the force. In the offense, LOCs may become extended and require rapid changes based on the fluid nature of the attack.

The division engineer, aided by the division rear CP engineer, assists the ADC-S in developing engineer requirements and controlling the engineer units committed to rear operations. The division rear CP engineer, in coordination with the ADE and the division TAC CP engineer, anticipates mission requirements for engineer Class IV/V supplies to be pushed forward to the attacking brigades. Finally, engineers may assist in the development of base camp and base cluster defenses to protect sustainment units from rear area threats. Division engineers are not equipped to handle the diverse, equipment-intensive tasks involved in rear operations. Therefore, corps assets under the division's control are normally tasked with rear area missions.

DIVISION OFFENSIVE FORMS OF MANEUVER

Divisions use three basic forms of maneuver in conducting offensive operations: envelopment, penetration, and frontal attack. The division commander determines which form of maneuver to use based on his METT-T analysis. He uses the form of maneuver as an expression of intent and overall concept of the operation that gives focus to division planning. It is imperative that the division engineer understand each form of maneuver and its implications in developing the scheme of engineer operations and task organization. Two other forms of offensive maneuver are the double envelopment and the turning movement. These forms of maneuver normally require forces beyond the scope of the division and are more applicable to corps operations.

Envelopment

In the envelopment, the division uses a supporting attack to hold the enemy in position while the main effort passes around the

main defense and attacks a flank (Figure 3-1). The objective of the main attack can be either force or terrain oriented. The main attack may be used to attack and roll up enemy forces in the main defensive belt, second-echelon defense, or reserves. When the objective is terrain oriented, the main attack is nor really focused on securing key terrain which cuts the enemy's LOCs or escape routes.

The mission and nature of supporting and enveloping forces provide the division engineer with some unique challenges in developing a scheme of engineer operations. The engineer main effort must be initially directed to the mobility of the enveloping force and protection of its extended flanks. The brigades and task forces that make up the enveloping force nor really organize for in- stride breaching operations because once committed, they must have the capability to breach unforeseen obstacles quickly with minimal delay and maneuver. The division engineer must develop an engineer task organization that facilitates organization for task force in-stride breaches. Engineer task organization must provide for both flexibility and redundancy; the main effort cannot afford to wait for low-density equipment to be brought forward or replaced.

Another important aspect of providing mobility to the main effort is maintaining the enveloping force's LOCs. In the envelopment, the LOC for the main effort can quickly become extended, shifted in response to the attack, or threatened by bypassed units. A division envelopment may require an engineer force dedicated to constructing,

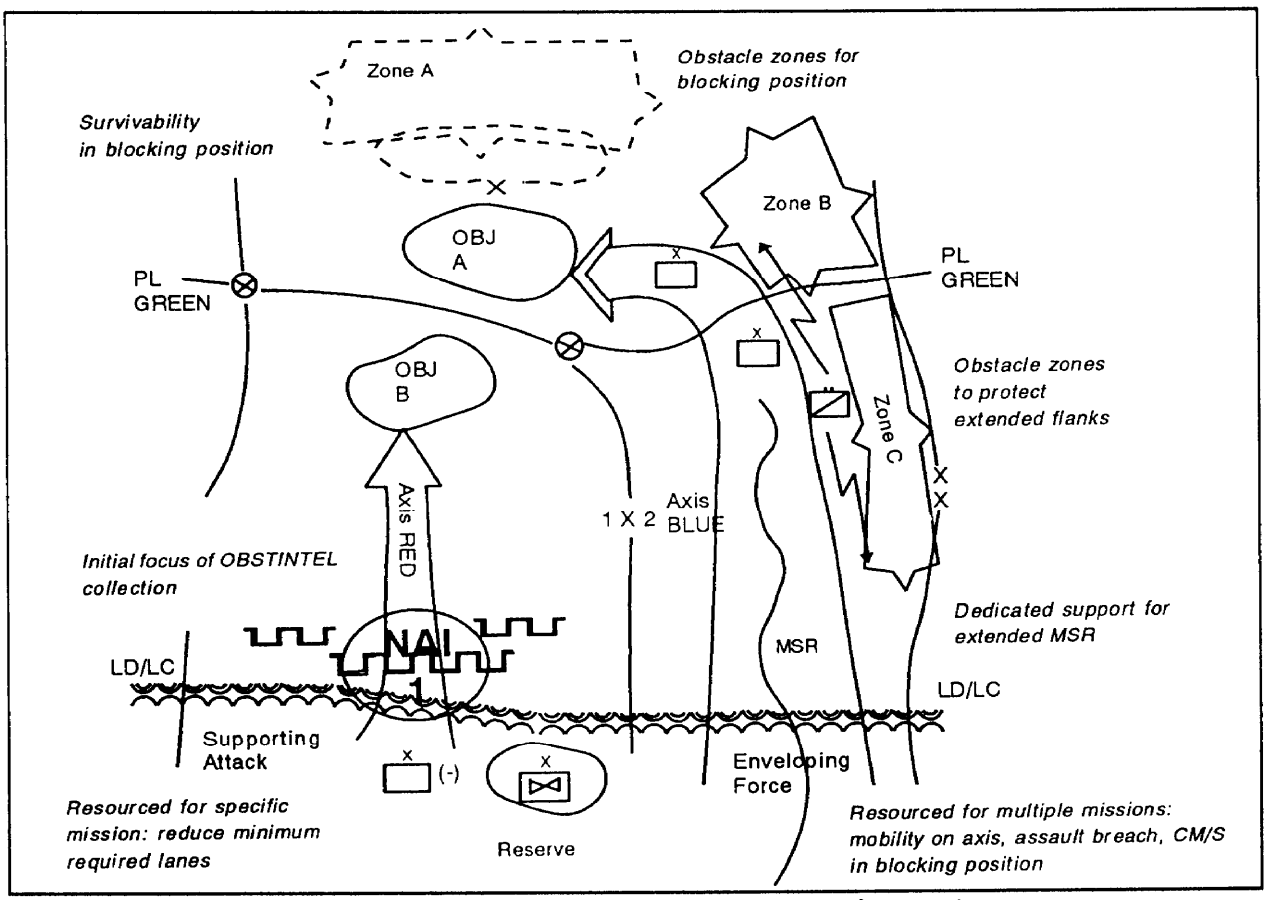


Figure 3-1. Engineer support to an envelopment

maintaining, or improving LOCs. Establishing LOCs for the enveloping force is a division responsibility. Therefore, engineers supporting the LOC effort are normally under DIVEN organization control and made up of corps assets. The focus of division engineers with enveloping forces cannot be diverted by LOC operations.

To provide engineer support to actions on the objective, the division engineer must have a thorough understanding of the enveloping force mission. As stated earlier, the mission of the enveloping force may be to attack and roll up a defending enemy force or reserve. The main effort of engineer support remains mobility. The task organization must provide attacking battalions with assault-breach capability. However, the mission may be to secure key terrain which cuts enemy LOCs. The enveloping force may establish blocking positions. Therefore, engineer support to actions on the objective may also require counter mobility and survivability operations. In these cases, the division engineer must ensure that the enveloping force has the assets to both maintain its mobility during the attack and establish effective blocking positions.

While the main effort of engineer support and concentration of engineer force is with the enveloping force, the supporting attack is too important to discount its engineer requirements. The supporting attack is likely to be the only force required to breach extensive obstacles to accomplish its mission. More importantly, the success of the main effort may depend on the ability of the supporting attack to penetrate the obstacles and cause the enemy to fight in two directions. Engineer support to the supporting attack must be limited in scope. The division engineer must carefully analyze the requirements of the supporting attack. This may require focusing on the maneuver plan two levels down through close coordination with breaching task force commanders. The division engineer will often have to accept a degree of risk and allocate the minimum force necessary to accomplish the mobility requirements. However, he can reduce the risk by initially focusing obstacle intelligence (OBSTINTEL) collection to confirm or deny assumptions made about the enemy situation facing the supporting attack.

Penetration

The division commander uses penetration to attack through the enemy's principal defensive positions, break the integrity of the defense, and defeat the enemy in detail. Penetration is conducted when the enemy force is overextended, a weakness is detected, or an assailable flank is not available. The division conducts penetration in three phases: rupture the enemy's defensive positions, widen the gap, and secure objectives that destroy the continuity of the defense. Once the division achieves penetration, it exploits by attacking deep into the enemy's rear areas (Figure 3-2, page 3-8). The division uses its main attack to rupture the enemy's defense. Supporting attacks protect the flank of the main effort and widen the gap by defeating adjacent enemy forces. Follow-and-support forces are used to clear the zone, widen the penetration, or secure the lodgment from counterattack. The division reserve is positioned to assist the main attack and exploit success.

The scheme of engineer operations to support a division penetration must provide the lead brigades in the main effort with overwhelming mobility to decisively rupture the enemy's obstacles. This remains the engineer main effort until penetration is achieved. It requires the division engineer to mass obstacle reduction assets into the engineer battalions supporting the attacking brigades. Penetration requires the rapid projection of combat power to maintain the momentum of the attack and quickly divide the enemy force. To do so requires reducing more lanes along a more narrow front than normally associated with breaching

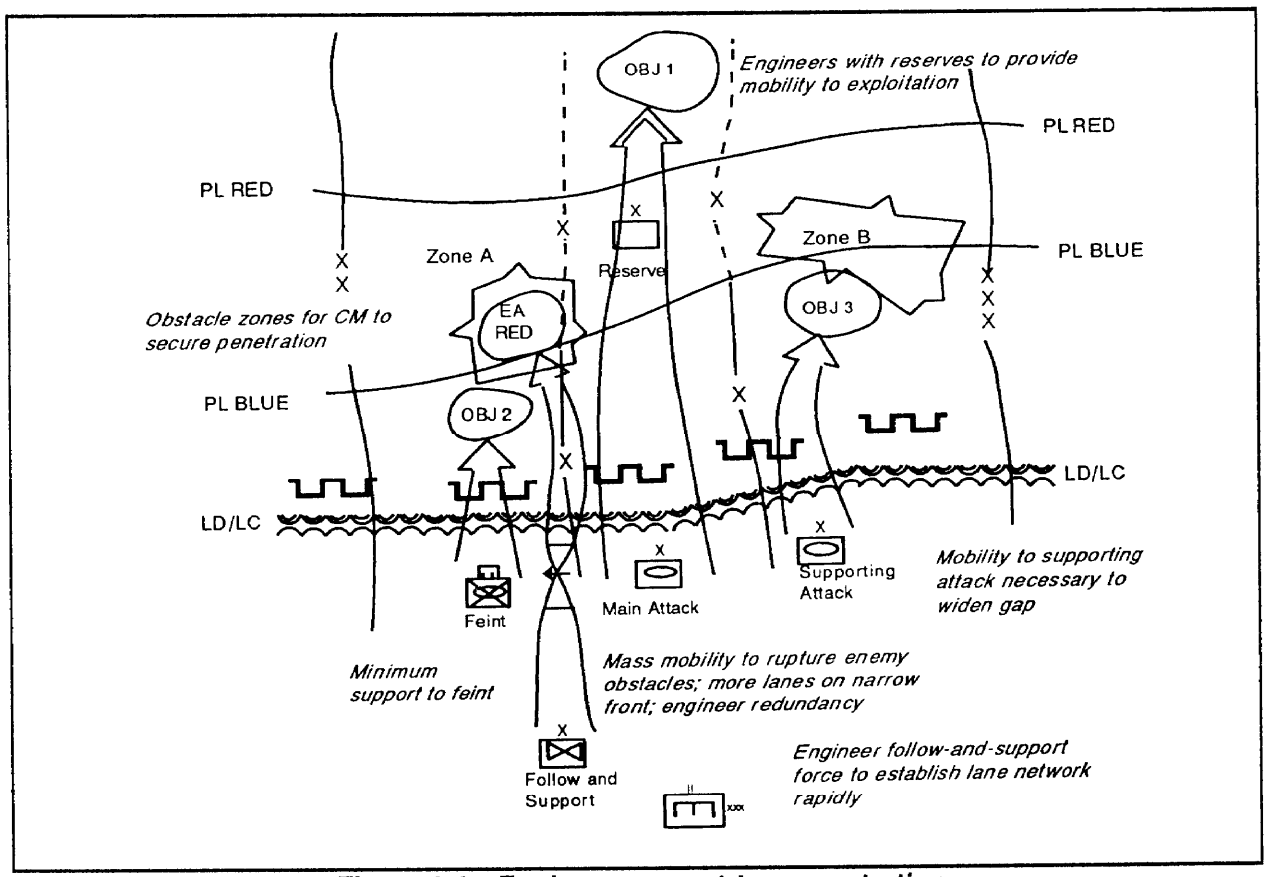


Figure 3-2. Engineer support to a penetration

operations. Therefore, mass and redundancy drive engineer support to the main attack.

As penetration is achieved, the engineer main effort shifts to providing mobility to forces widening the gap. The division may use supporting attacks or follow-and-support forces to widen the penetration. The division engineer must understand the division commander's intent for widening the penetration to ensure forces have the appropriate engineer support. When a follow-and-support force is employed to simultaneously clear the zone and widen the gap, the engineer task organization must support decentralized mobility operations. If the supporting attack is the primary mechanism for widening the gap, it may require a smaller, more centralized organization.

Depending on the enemy situation, countermobility may quickly become the main effort to help defeat counterattacks against the lodgment. The division normally uses follow-and-support forces to secure the lodgment and defeat any counterattacks. Therefore, the division engineer anticipates the size of counterattack force, analyzes likely avenues of approach, and allocates the countermobility assets needed to disrupt or fix counterattack forces. He must plan obstacle zones that permit the use of tactical and situational obstacles. These obstacle zones are normally developed and passed to the brigades for planning but are only active on the order of the division. Forces securing the lodgment require flexible and responsive obstacle capability such as artillery-delivered scatterable mines and air and ground Volcanos.

Once the lodgment is secured, the engineer priority shifts to assisting the division in

exploiting its success by ensuring the mobility of the exploiting brigades. The division engineer uses two mechanisms to support the exploitation. First, the scheme of engineer operations must allow for the rapid development of a lane network within the penetration. The lane network must support both the uninterrupted forward passage of the division reserve to subsequent objectives and the flow of sustainment to forces in the penetration. The division engineer constitutes an engineer follow-and-support force, made of corps assets, to establish, improve, and maintain the lane network. Chapter 5 discusses engineer considerations for large-scale breaching operations in more detail. Second, the division engineer must ensure that the reserve has the engineer task organization necessary to maintain its own mobility as it attacks deep in the enemy's rear area.

Frontal Attack

The division uses a frontal attack to overrun, destroy, or capture a weaker enemy force in position. A division may employ a frontal attack as part of the supporting attack of a corps envelopment. It is the least desirable form of maneuver because it does not easily facilitate massing overwhelming combat power against an enemy weakness or assailable flank. In the frontal attack, the division strikes along the enemy's entire front with two or more brigades abreast attacking in the zone (Figure 3-3, page 3-10). It is only favored when the enemy is weak or disorganized, the situation is not fully developed, the situation requires immediate reaction to enemy action, or the division mission is to fix the enemy in position.

The challenge to the division engineer in supporting the frontal attack is to provide adequate mobility support across a wide front on multiple axes. The nature of the mission may prevent massing overwhelming mobility support from the division perspective. However, the division engineer must ensure that the engineer task organization allows attacking brigades and task forces to mass engineers as required at their level. Quickly attacking a weak or disorganized enemy with the situation relatively unclear demands in-stride breaching capability at the brigade and possibly task force levels. Therefore, the division engineer balances organic and supporting engineers in each attacking brigade instead of in any one brigade.

The division engineer again uses corps assets as an engineer follow-and-support force. The mission of the engineer follow-and-support force is to upgrade breaching lanes and construct or improve MSRs. The decentralized nature of the frontal attack also requires a follow-and-support force capable of decentralized operations. Division engineers with the brigades reduce the lanes necessary to seize brigade objectives. Therefore, corps engineer efforts to upgrade lanes in each brigade zone of attack focuses on passing sustainment traffic rather than combat power. MSR requirements are also decentralized to sustain multiple axes. A corps CSE company, for example, may allocate one of its three CSE platoons to each brigade MSR.

Finally, the division engineer must consider the needs of each brigade to establish a hasty defense on its objective. Again, with brigades attacking in zones, each will normally consolidate on separate objectives and establish distinct hasty defensive positions. The division engineer must be sensitive to the decentralized nature of the division hasty defense. He must ensure that each brigade has the assets necessary for immediate and responsive obstacle and survivability support. If the division plan is to establish a deliberate defense immediately upon consolidation, the division engineer must consider task organizing corps assets to each brigade from the outset of the attack. Additionally, he plans for and coordinates with the Assistant Chief of Staff, G4 (Logistics) (G4) to pre-position and push necessary Class IV/V (mines) supplies to the brigades.

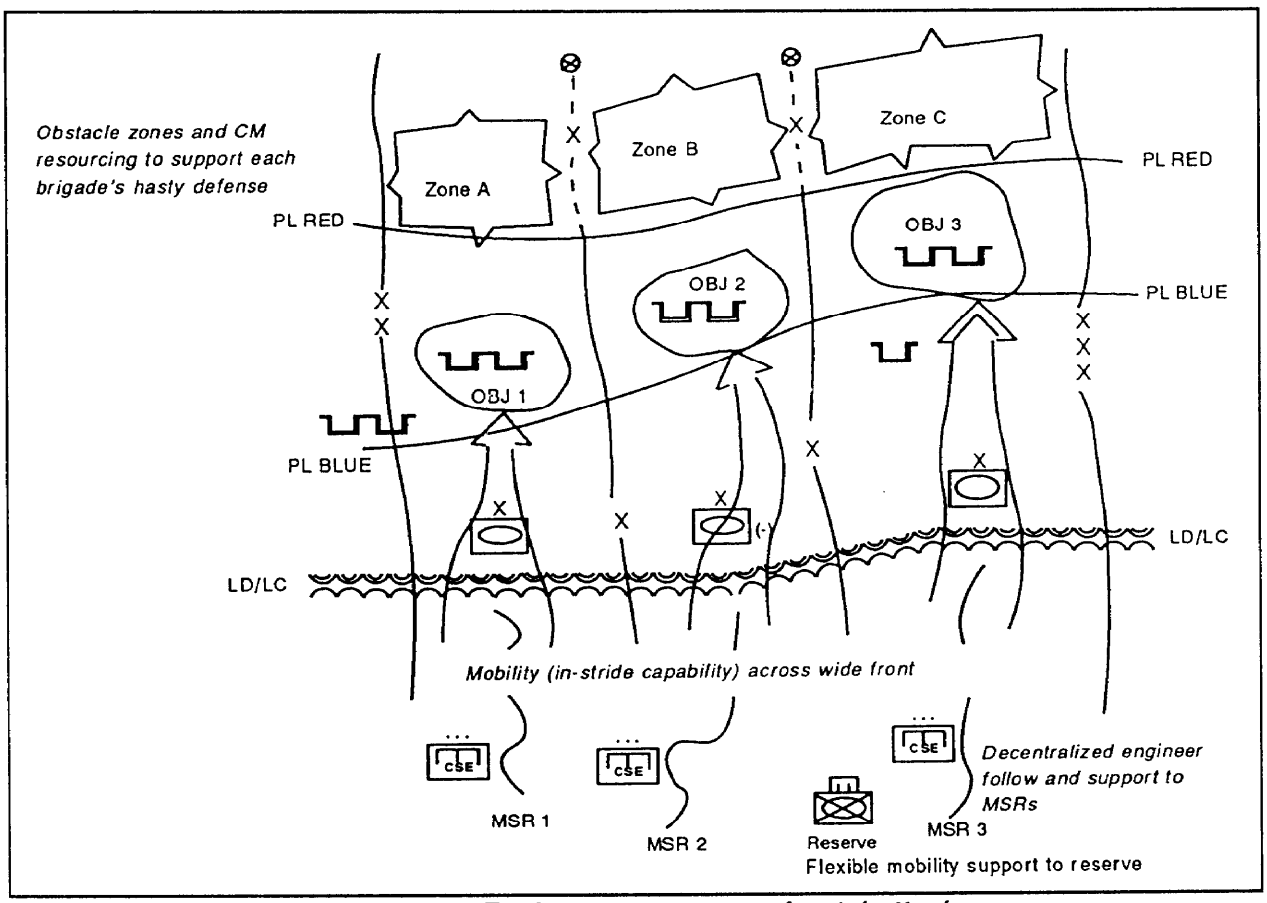


Figure 3-3. Engineer support to a frontal attack

ENGINEER OFFENSIVE PLANNING

This section focuses on planning engineer support for offensive missions. The engineer estimate provides the planning framework for the division engineer to integrate into the division's command estimate process. It provides a systematic procedure for developing the engineer task organization and scheme of engineer operations to support the division in offensive operations. The basic estimate process is found in Appendix A.

The engineer estimate and offensive planning process begins with the division engineer receiving his mission. This mission is extracted from the corps OPORD, the engineer annex, graphics, and the division's WARNORD. Based on the identified mission, the division engineer supports the division mission analysis process in the development of facts and assumptions. Working simultaneously with the G2 and G3, he conducts the EBA. The EBA consists of analyzing the terrain and assessing the enemy and friendly engineer capability.

The terrain analysis is conducted in conjunction with the G2, using the observation and fields of fire, cover and concealment, obstacles, key terrain, avenues of approach (OCOKA) framework. The terrain analysis is then used to develop the enemy situation template and the corresponding friendly scheme of maneuver. For the offense, the terrain analysis focuses on identifying where the enemy will defend, where the division

can move while conducting its offensive operation, and where the division is vulnerable to flank attack and enemy counterattack.

The division engineer works with the G2 in identifying the engineer capability of both the enemy maneuver and engineer forces. Based on the knowledge of how the enemy engineers support defensive operations and the specific enemy capability to conduct engineer operations, the division engineer plots enemy obstacles and the estimated survivability status on the situation template. Based on the situation template, he develops specific enemy engineer intelligence requirements and nominates NAI to incorporate into the division's reconnaissance plan.

Working with the G3, the division engineer analyzes the friendly engineer capability based on the current organic and corps assets available in both the engineer and maneuver organizations. To do this, he accounts for all available and mission-capable engineer assets that will support the division. Additionally, he accounts for other division mobility assets, such as mine plows and rollers.

The division engineer continues the mission analysis by conducting a complete review of the higher command's OPLAN or OPORD, including operational graphics. The division engineer focuses on the identification of specified and implied tasks, additional engineer assets available in the task organization, the specified acceptable risk, and the time available to conduct the mission. Based on this analysis, the division engineer determines what engineer tasks are essential to the mission and provides this information to the G3 for inclusion in the restated mission.

Following the development and approval of the restated mission, the division commander issues his guidance and intent. The division engineer must identify the form of maneuver and the type of attack the division will employ from the division commander's guidance and intent. Based on this, the division engineer confirms specified, implied, and essential engineer tasks and prepares to support course-of-action development.

Based on each course of action, the division engineer looks two levels down at maneuver task forces and develops a scheme of engineer operations, focusing on essential engineer tasks. He focuses on mobility support first. Using the division commander's intent, the terrain analysis, and the situation template, the division engineer identifies the required mobility tasks and the engineer assets needed to perform them. Next, he looks at countermobility tasks, including those required to provide flank and rear security during movement and those required to support hasty defenses on the objective. He identifies the assets required to accomplish those missions and he conducts the same analysis for survivability and sustainment engineering missions.

Having identified the tasks and assets required for a course of action, the division engineer establishes where the engineer main effort must be. He then reviews the engineer and maneuver assets available, allocates engineer assets and recommends the allocation of maneuver assets to accomplish the tasks, and identifies shortfalls in assets. If shortfalls exist, he reviews the allocation of resources to confirm the shortfall. Upon verification of the shortfall, he requests additional assets from corps through the G3. If additional assets are not available, the division engineer focuses on main effort tasks and reallocates assets to compensate for the shortfall. Critical to this process is identifying the risk associated with the shortage of engineer forces and addressing the risk during war gaming and course-of-action comparison.

Having allocated assets to accomplish engineer tasks, the division engineer focuses on C2. Using the habitual relationship C2 structure, he ensures that the assets assigned to each headquarters do not exceed

their span-of-control capability. If a shortfall exists, he analyzes all available C2 headquarters and upgrades the C2 structure, if feasible, or identifies, analyzes, and communicates the risk of not increasing the C2 during war gaming and course-of-action comparison. For offensive missions, he weighs the specific engineer mission requirements and communications of organic and corps engineer C2 headquarters.

Once courses of action have been wargamed, compared, and recommended, the division commander decides how the offensive mission will be conducted and gives his intent and concept of the operation. Based on this, the division engineer refines the division's engineer missions and develops a scheme of engineer operations for inclusion in the execution paragraph of the division's basic OPLAN or OPORD, focusing on total integration into the division's scheme of maneuver. To accomplish these tasks, the division engineer finalizes the engineer task organization and command/support relationships, assigns engineer tasks to the division's subordinate units in subunit and coordinating instructions, provides engineer-specific input into the service-and-support paragraph, and develops the engineer annex. He then briefs the division's engineer plan to the brigade commanders at the division OPORD.

Simultaneously, the DIVEN engineer staff develops the engineer OPLAN and OPORD. It ensures complete dissemination to all engineer units working for the division. Chapter 2 deals more specifically with this process. Finally, the division engineer closely monitors the preparation and execution of the mission, refining the plan as necessary based on the situation. He must maintain continuous liaison with other command and staff organizations to ensure the synchronization of engineer actions within the scope of the division plan.

OFFENSIVE OPERATIONS: ARMORED DIVISION

Armored divisions conduct five types of offensive operations. They are–

1. Movement to contact (MTC).

2. Hasty attack (HATK).

3. Deliberate attack (DATK).

4. Exploitation.

5. Pursuit.

FM 71-100 contains a description of each type of offensive operation. Understanding the principles and organization of each operation is key to the division engineer providing appropriate planning and engineer force allocation to support offensive operations.

Movement to Contact

The division conducts a MTC to gain or regain contact with the enemy, limiting the risk to the smallest possible part of the force. The primary consideration in preparing for a MTC is anticipating actions during movement and requirements for maneuver and fire support when contact is made. An armored division MTC is normally organized with a covering force, an advance guard, a main body, and flank and rear security elements.

An MTC has several possible outcomes. First, a division may not make contact with the enemy and reach its objective unopposed. This action could result in continuing the MTC to a subsequent objective or establishing a hasty defense oriented around key

terrain. Second, a meeting engagement may occur where the division meets an unexpected moving or stationary force.

A meeting engagement will result in a rapid decision to conduct a HATK, hasty defense, or a combination of both. Another possibility is to bypass the enemy force altogether. When the division has a clear picture of the disposition of a moving enemy, the division may exercise a third option. The division may gain the advantage by moving to advantageous terrain and preparing for a hasty defense, HATK, or a combination that destroys the enemy force. This third option differs in that the division chooses the ground to fight on and sets the conditions for battle while not in contact. Due to the variety of actions that may occur, the engineer force must be configured to accomplish mobility, countermobility, and to a limited degree, survivability operations to support a MTC.

The division engineer must understand the objective of the MTC and all contingencies to the plan. Planning begins by identifying engineer tasks and allocating forces. Figure 3-4, page 3-14, shows the basic engineer tasks germane to an armored division MTC.

When identifying engineer tasks and allocating forces, the division engineer must consider each component of the MTC and the inherent engineer missions they must perform. Following the identification of the engineer tasks for the covering force, advance guard, flank and rear guard, and main body, the division engineer allocates the necessary forces and assets to accomplish those tasks. The division engineer then task organizes units based on his force allocation and C2 requirements.

The covering force in a MTC develops the situation and prevents unnecessary delay of the main body. Its missions include destroying enemy resistance, securing key terrain, or containing enemy forces. The covering force, if the division is not part of a larger forces movement, is normally the division CAV squadron or a task force from the advance guard brigade. The engineer mission requirements to support covering force operations are primarily reconnaissance to gain intelligence and mobility operations to sustain the freedom of maneuver of the covering force.

Although it has no dedicated engineer support, the division CAV squadron will require engineer support to accomplish its engineer tasks. A division or corps engineer company will normally be attached. If the covering force is a task force from the advance guard brigade, the habitually related division engineer company provides support for engineer missions.

Engineer support to covering force operations is characterized by early linkup, detailed combined arms planning and rehearsals, and thorough integration into the combined arms team. This is even more important when a CAV squadron is the covering force, since the CAV squadron and the engineer company are not habitually associated and probably have not conducted appreciable combined arms training. For this reason, the division engineer should incorporate as many division engineer companies as possible into the training plan of the division CAV squadron as often as possible.

The advance guard in a MTC is normally formed from and controlled by the lead element of the main body. The advance guard maintains contact with the covering force and is task organized to support the uninterrupted movement of the main body. The primary mission of the engineer force supporting the advance guard is to maintain the advance guard's freedom to maneuver. The advance guard may also require counter mobility support, especially if the intent is to fix the enemy and allow the main body to maneuver and attack a flank. Situational obstacle planning and execution, in close coordination with intelligence provided by the covering force, must be considered. Engineer support for this operation comes

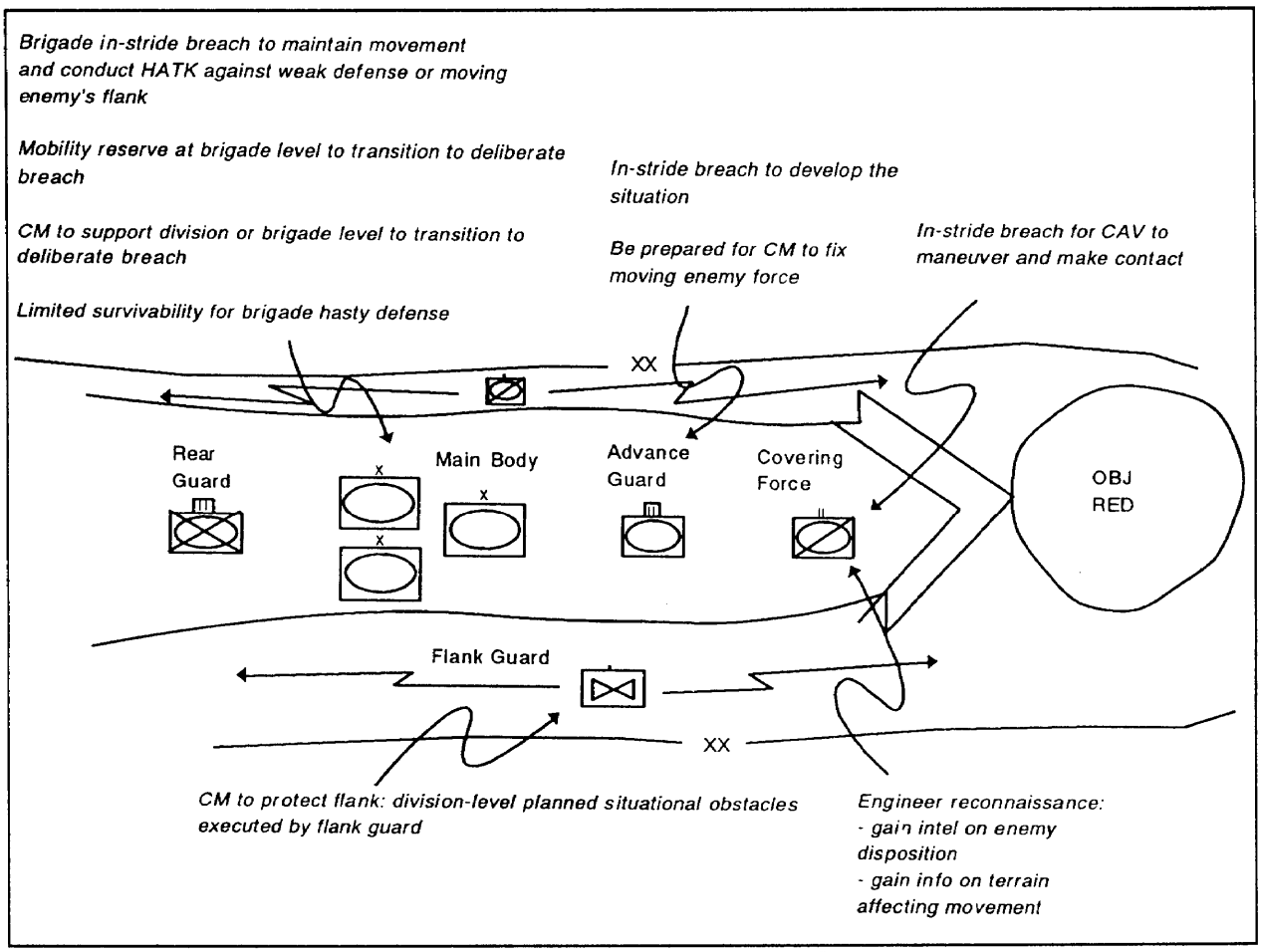


Figure 3-4. Engineer support to a MTC: armored

from the habitually associated division engineer battalion that supports the brigade that controls the advance guard.

Flank and rear guards protect the main body from ground observation and surprise attack. Units conducting flank and rear guard missions may be designated by the division, or the division may direct subordinate units to conduct their own guard operations.

While there is not necessarily a dedicated engineer force with the flank or rear guard, countermobility operations are an inherent task. In this case, the division engineer has the responsibility to plan obstacle zones and coordinate situational obstacles to assist in repelling attacks from the flanks or rear. If the situational obstacle is one that uses engineer assets such as ground Volcano or a rapid obstacle team, engineers will be task organized to the unit conducting the flank or rear guard. Linkup, incorporation into the orders process, rehearsals, and CSS are vital to the operation's success. The execution of situational obstacles must be controlled by the flank or rear guard commander.

The division engineer must conduct close coordination with the division staff and the commanders of the flank and rear guards. This coordination must determine the type and effect of the obstacle, the NAI/decision point (DP), the targeted area of interest (TAI), the execution criteria, and the maneuver

and fire-support forces that will cover the obstacle to gain the combat multiplying effect.

The main body in a MTC is organized and deployed with the capability to conduct HATKs, hasty defenses, or both. Engineers supporting the main body focus primarily on mobility and countermobility operations. Limited survivability support may be required. Mobility missions include in-stride breaching operations at the brigade or battalion level. The brigades and battalions must also have the capability to transition to a deliberate breach. Therefore, brigades and battalions must have the forces necessary to create a strong mobility reserve at task force and brigade level.

Countermobility operations support to the main body centers around supporting a hasty defense. The hasty defense may be conducted on the objective, as a contingency based on mission analysis, or as a reaction to the tactical situation during the MTC. The division engineer must plan to support all of these possibilities. Understanding all contingencies is essential. Engineer forces are task organized within the main body to give each brigade the flexibility to conduct hasty defenses, to fix enemy forces, or to protect flanks.

Limited survivability requirements are directed or identified through the mission-analysis process. These requirements include providing protective positions for C2 nodes, ADA, or critical fighting positions. Time normally prohibits these operations.

The division engineer plans to support hasty defense operations on the objective by planning obstacle zones and resourcing them based on envisioning the obstacle belts they contain. He ensures that the coordination necessary to deliver the obstacle material is conducted with the DISCOM. Other details, such as emplacement time, lanes, and duration of scatterable mines, must be considered to facilitate future operations. Activation of the obstacle zones and belts is held as an on order mission, pending the decision of what and when the next mission for the division will be.

Contingency hasty defensive operations are developed based on the terrain and the size and location of both the friendly and enemy forces. A commander may elect to execute a hasty defense on favorable terrain, based on the action of the enemy and clearly defined PIR and execution criteria. The division engineer plans to support contingency hasty defensive missions like a planned hasty defense on the objective.

The division, or a portion of it, may receive FRAGOs to conduct hasty defensive operations based on the tactical situation. As a response to the FRAGO, the division engineer and division engineer battalion planners immediately designate obstacle zones and belts to support the hasty defense. Time will normally be limited in this type of operation, and countermobility support will normally be in the form of scatterable mines. The division engineer and division engineer battalion planners must identify the countermobility resources available, allocate the resources, coordinate the delivery and emplacement of mission-required push packages, and monitor the emplacement status. Figure 3-5, page 3-16, shows a possible engineer force laydown to support the engineer missions of the component forces in a MTC.

Hasty Attack

A HATK is an offensive operation for which the unit has not made extensive preparations. A division conducts a HATK with the resources immediately available in order to maintain momentum or to take advantage of the enemy situation. A HATK may be conducted in a number of situations. These include conducting the HATK as a planned contingency during a MTC or as an unforeseen contingency during hasty or deliberate defenses and DATKs.

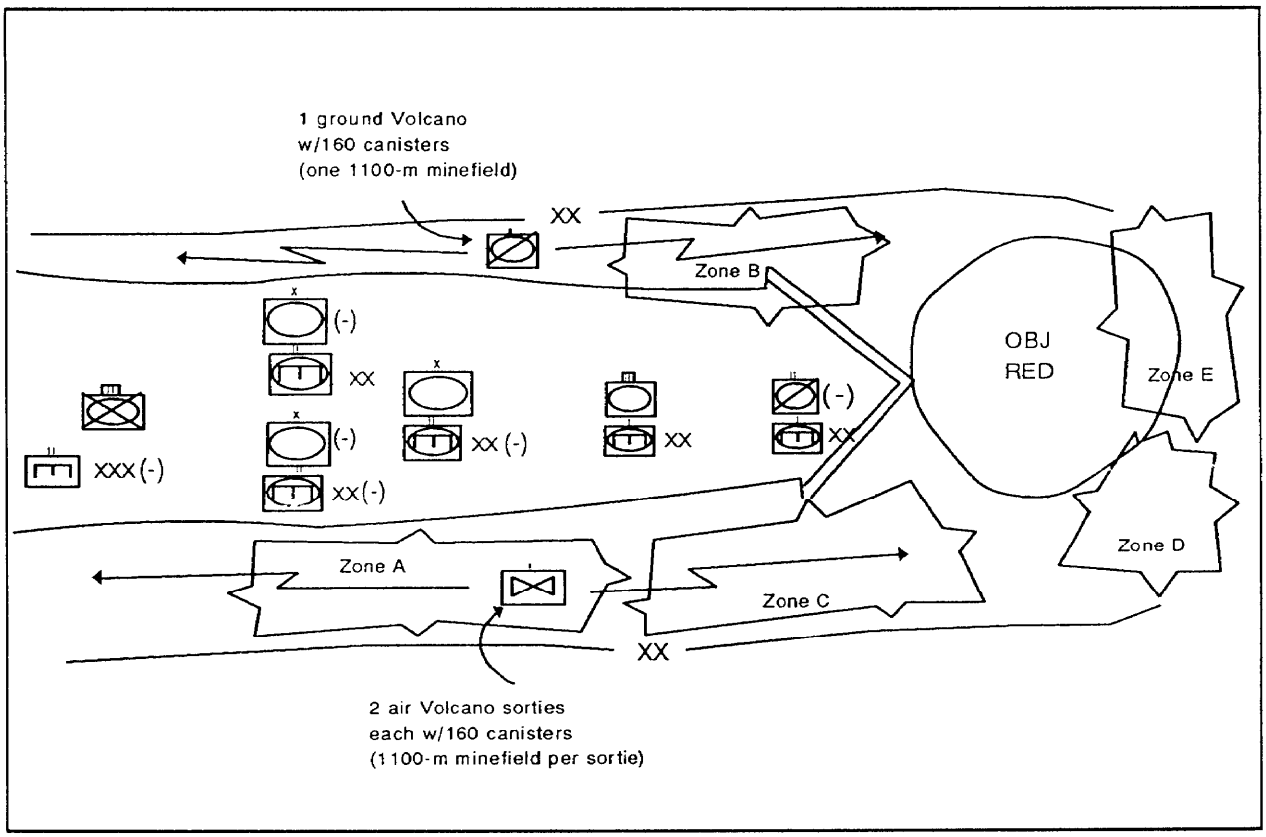


Figure 3-5. Engineer force laydown for a MTC: armored

Mobility support to the HATK is the division engineer's initial concern. He focuses on maintaining the attacking force's freedom of maneuver. Countermobility support is also planned; the focus is on isolating the battlefield and protecting flanks during the attack. Countermobility and survivability support becomes priority when the objective is seized to assist the division in securing the objective and repelling enemy counterattacks. The division engineer plans to support HATKs by identifying engineer tasks during the mission-analysis process and allocating forces to accomplish those tasks.

The division engineer must also consider the sustainment engineering tasks necessary to exploit the success of the HATK. While these missions are not necessarily part of the HATK, they may become critical to exploiting success. For example, a HATK against a disorganized enemy may quickly evolve into a pursuit. Maintaining the momentum of the attack may quickly become a function of the division's ability to sustain the force. An engineer priority at this point is improvement and maintenance of MSRs. Therefore, the division engineer considers sustainment tasks that may evolve as a result of the HATK and pre-position the forces and resources necessary.

HATKs are always a planned contingency in an MTC. Figure 3-6 shows a division conducting an HATK on a moving force from a MTC and the inherent engineer tasks. The division engineer plans to support this mission by developing a decentralized and flexible engineer task organization to support the division's subordinate units. The nature of an MTC requires each maneuver brigade to be task organized with engineer units and have the capability to conduct engineer operations. Since there is no time

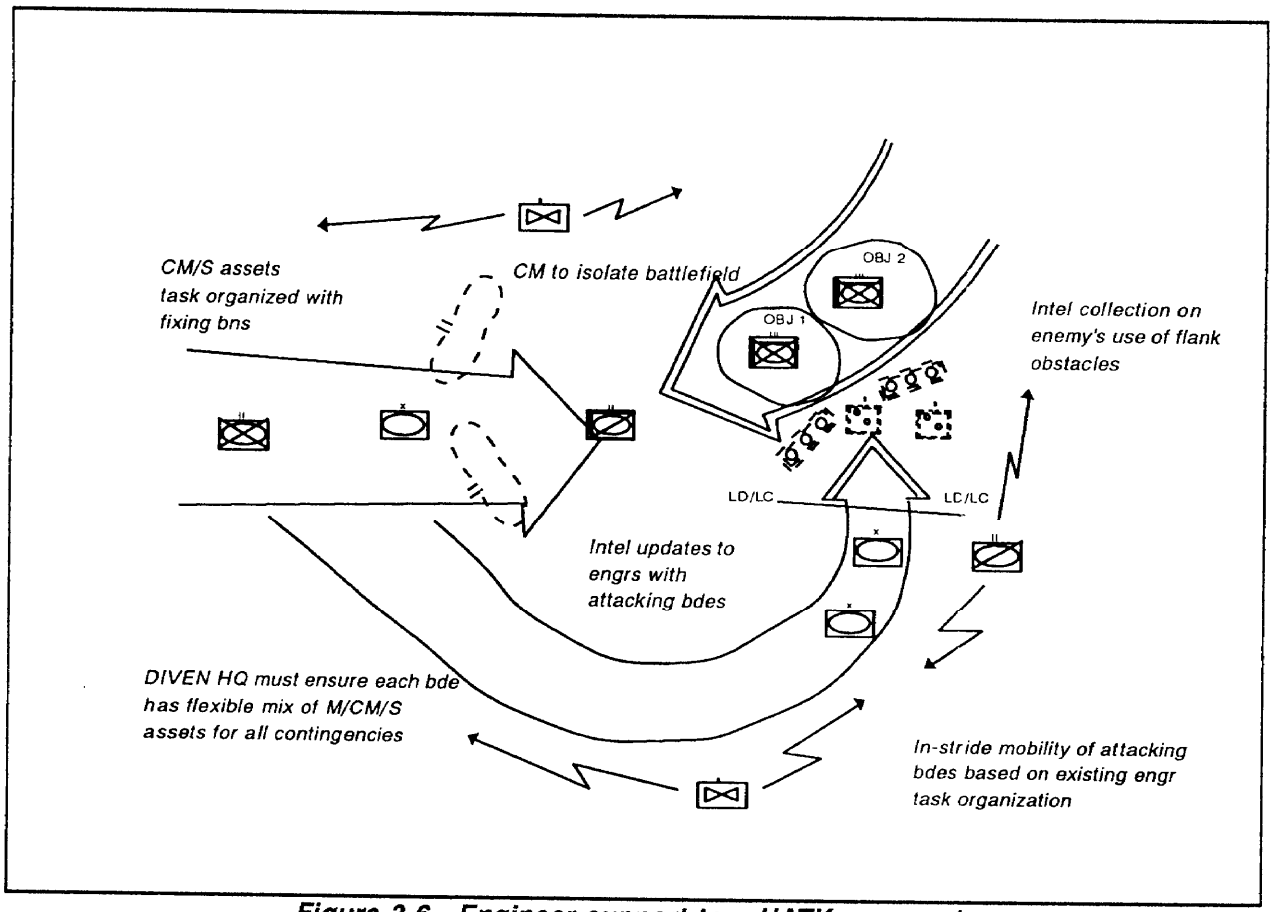


Figure 3-6. Engineer support to a HATK: armored

to shift assets, engineer support to the HATK is based on the existing task organization. Figure 3-7, page 3-18, shows a division conducting a HATK on a moving force from a MTC and the engineer task organization that supports the division's engineer tasks.

During the execution of the MTC, the division engineer closely monitors the battlefield. The disposition and activities of both friendly and enemy forces are of primary concern when transitioning to a HATK, and critical information is forwarded directly to subordinate engineer units. The division engineer also focuses on coordinating engineer operations between adjacent units during the HATK.

HATKs, in conjunction with a hasty or deliberate defense or a DATK, are normally driven by unforeseen battlefield circumstances and are executed as unplanned contingencies. They occur to defeat unexpectedly encountered enemy forces, as spoiling attacks against unexpected enemy offensive operations, or to counter enemy penetrations. These situations have several common threads. First, the HATK will probably be executed by the reserve force. Second, they occur very rapidly, with little or no planning and preparation time. Third, the division engineer has little impact during the execution of the HATK. His responsibility to supporting these missions revolves around planning and tailoring a flexible engineer task organization before the battle to support the reserve force. Additionally, he monitors the battlefield and directly passes essential intelligence to subordinate engineer units and coordinates the activities of engineers between adjacent units.

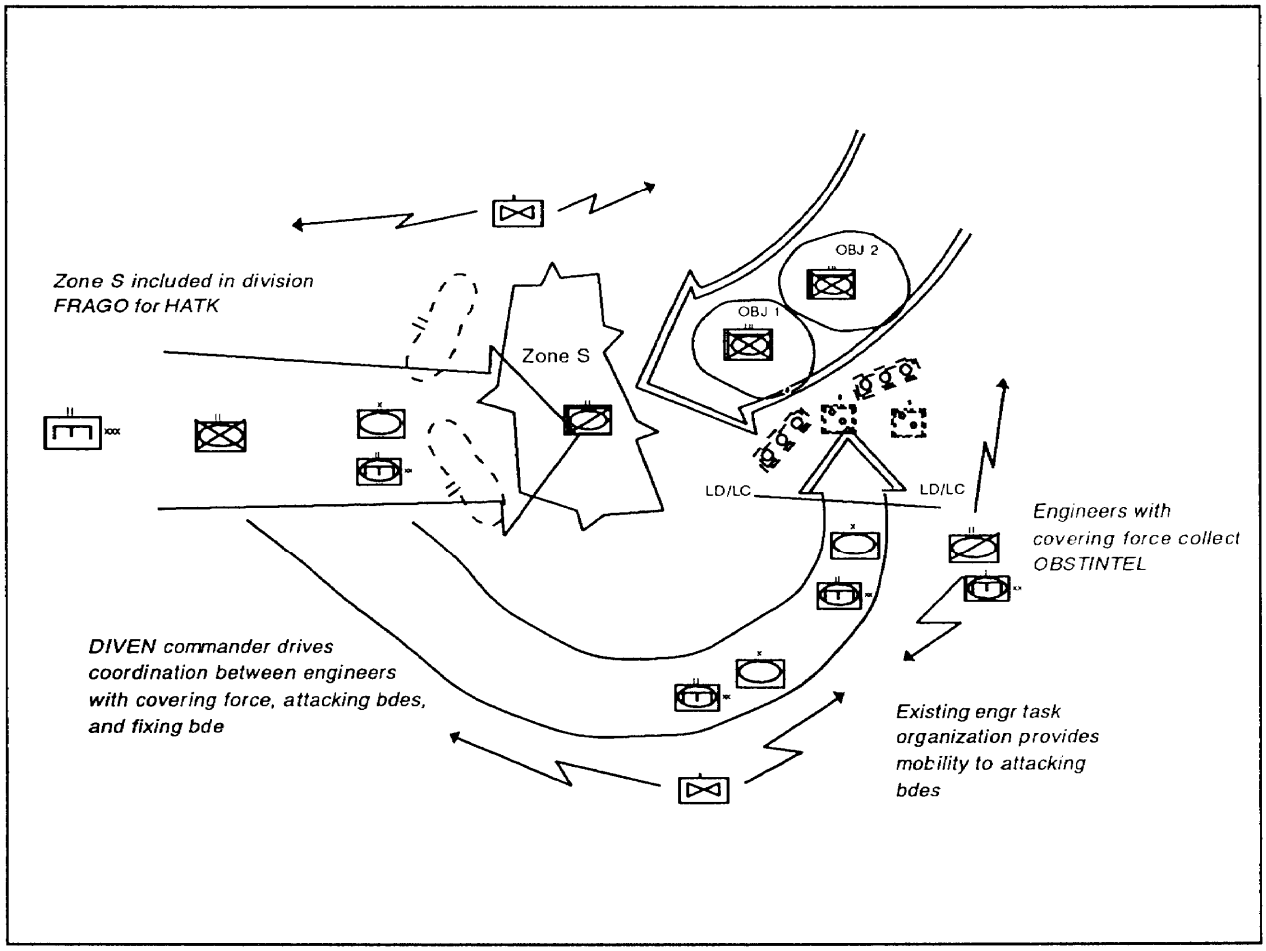


Figure 3-7. Engineer force laydown for a HATK: armored

Deliberate Attack

A DATK is an attack that is planned and carefully coordinated with all concerned elements. A DATK is based on thorough reconnaissance, evaluation of all intelligence and relative force ratios, analysis of various courses of action, and other factors affecting the situation. A DATK is expensive in terms of manpower, equipment, and supplies. It is generally conducted against a well-organized defense when a HATK is not possible or has been conducted and failed. This type of attack requires massed combat power on a narrow front in an area where there is a high probability of surprise.

The division engineer develops a scheme of engineer operations that focuses on providing mobility support throughout the depth of the division attack. While mobility is initially the main effort, the division engineer also carefully considers counter mobility operations. He must plan for the use of situational obstacles to assist in isolating the point of penetration from reinforcement and counterattack and provide supporting protection for the division flanks during the attack. He also develops countermobility and survivability plans for hasty defensive operations to assist in securing the objective once it is seized. Figure 3-8 shows the engineer missions inherent to a DATK.

Providing the necessary mobility support to the division's maneuver brigades is the division engineer's first priority in offensive planning. The allocation of engineer forces is based on the IPB/EBA and the mission analysis conducted during the command estimate. The division engineer must thoroughly understand the division commander's intent and scheme of maneuver, anticipate how the maneuver brigades will fight, and comprehend the threat situational template in order to properly conduct the engineer-mission analysis. The division engineer then looks at the task force level and identifies the number of lanes required for each of the maneuver brigade's task forces. He then compares the capabilities of the habitually related division engineer companies to the numbers of required lanes. If a shortfall exists, he allocates additional corps mechanized engineer units to the appropriate division engineer battalion. He then ensures that the existing engineer headquarters is sufficient to command and control the allocated forces.

Countermobility and survivability operations are also significant in supporting a DATK. Countermobility operations assist in isolating the battlefield and protecting the attacking force from enemy flank attack and counterattack. Again, the division engineer must understand the division commander's

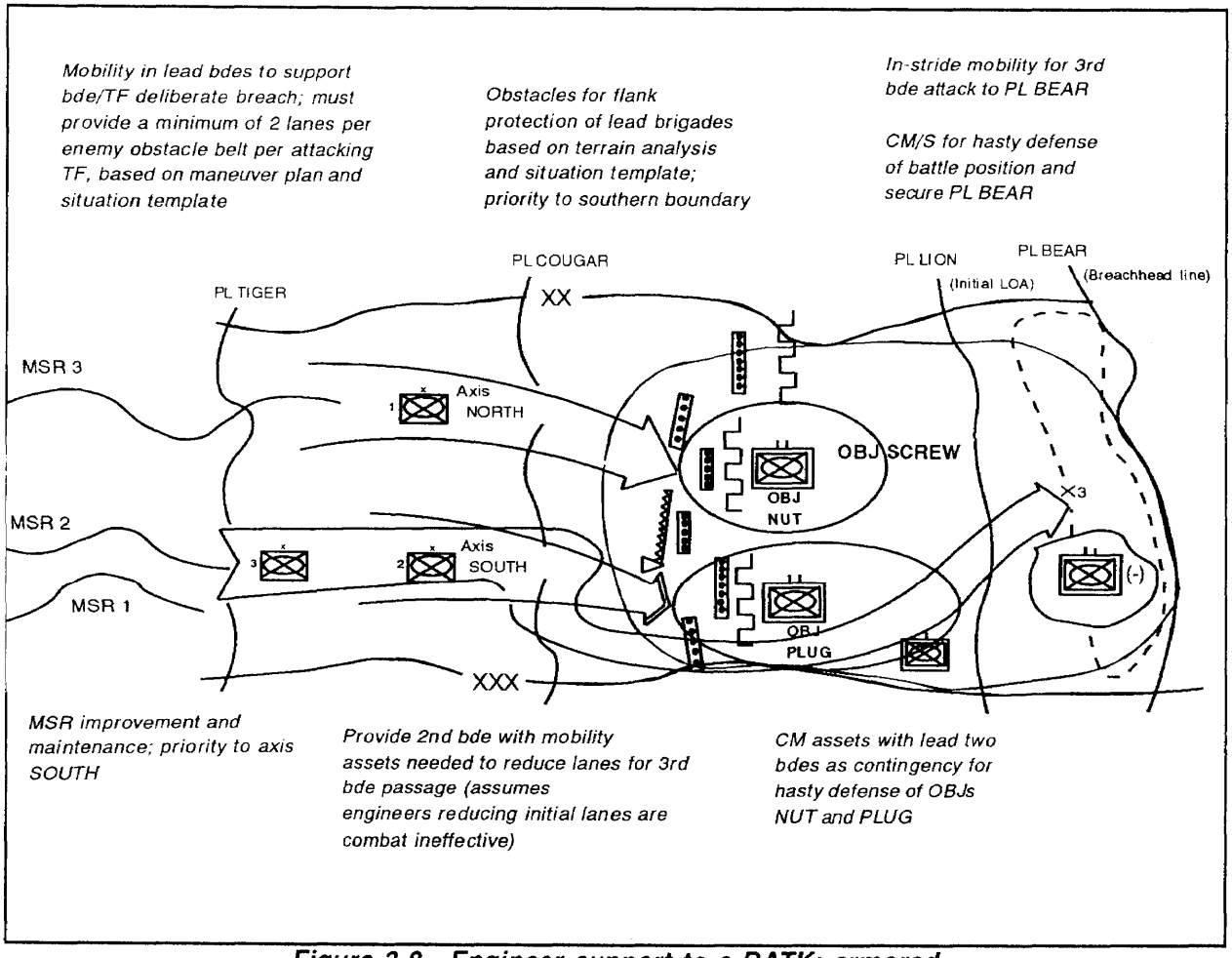


Figure 3-8. Engineer support to a DATK: armored

intent and must thoroughly understand all follow-on missions and contingency plans and allocate engineer forces to support them. This is accomplished through appropriate allocation of engineer assets to provide a flexible engineer force to maneuver brigades.

Using the division's event template, the division engineer estimates the time available to conduct counter mobility operations, including transporting obstacle materials to the designated locations, emplacing obstacles, and coordinating fires needed to obtain synergism. He must also coordinate with the DISCOM to ensure that push packages of mission-required Class IV/V supplies and the transportation assets required to haul them are planned and executed to support a hasty defense on the objective. He can influence countermobility operations during the execution of a DATK by accurately tracking the battle and advising the division commander on the use of scatterable mines and by assisting in deconflicting the division's priorities for their use.

The division engineer supports survivability operations by ensuring that maneuver brigades have sufficient blade assets in their engineer task organization. Survivability missions that support DATKs are based on the maneuver brigade commander's priorities and the survivability available in his task organization. Figure 3-9 shows a division conducting a DATK and the engineer task organization that supports the division's engineer tasks.

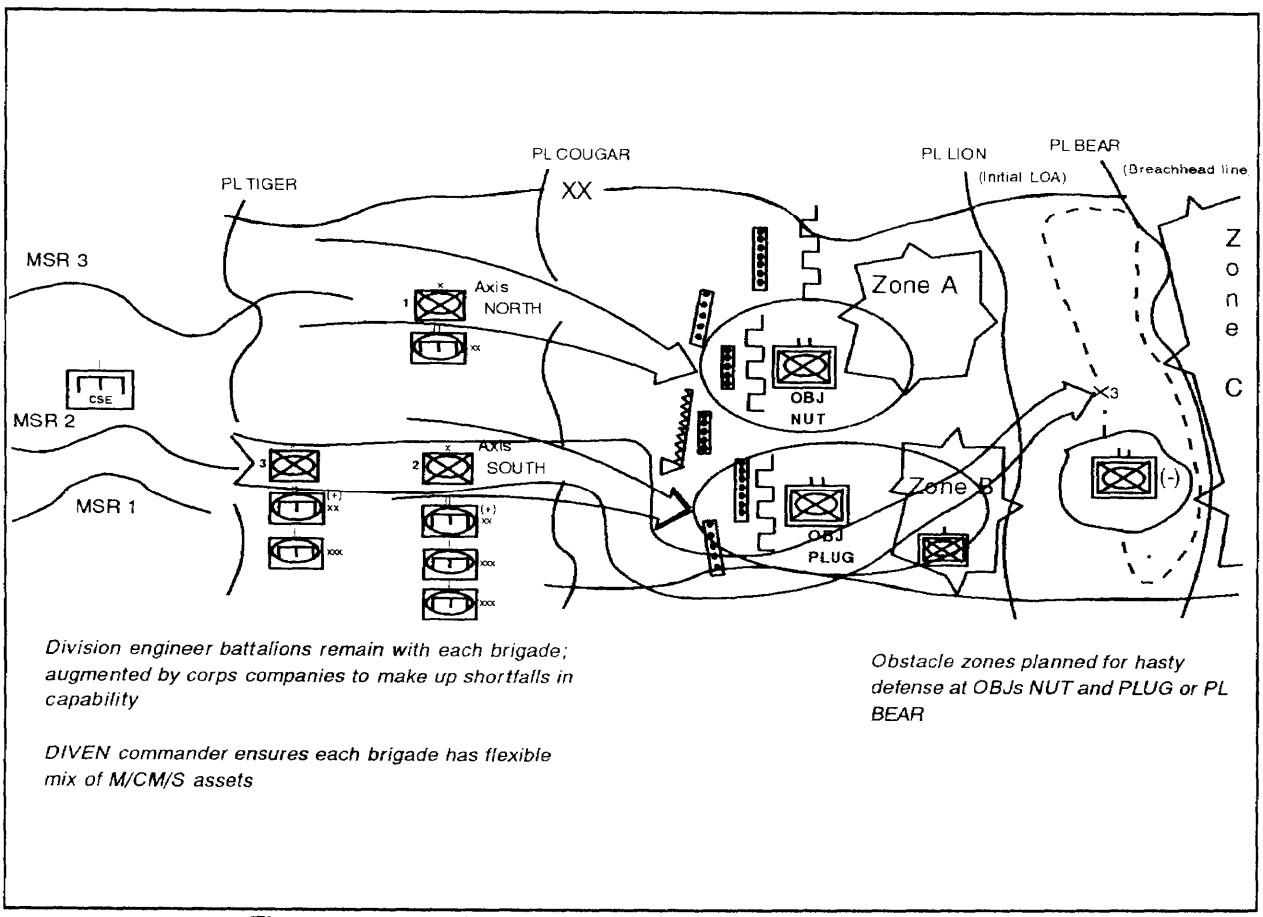


Figure 3-9. Engineer force laydown for a DATK: armored

Exploitation

An exploitation is an offensive maneuver that usually follows a successful HATK or DATK. An exploitation takes advantage of a weakened or collapsed enemy. The purpose of an exploitation is to prevent reconstitution of enemy defenses, prevent enemy withdrawal, and secure deep objectives. An exploitation is normally initiated by already-committed units using available forces to form both an exploiting force and a follow-and-support force. An exploitation is characterized by decentralized execution. The employment of forces is similar to an MTC. The division can either exploit its own success or act as the exploiting or follow-and-support force of a higher unit. Potential missions for the exploiting force are securing objectives deep in the enemy rear, securing LOCs, surrounding and destroying enemy forces, denying escape routes to an encircled force, and destroying enemy reserves.

Based on these missions, the exploiting force requires engineer support. Mobility operations are required to maintain the momentum of the exploiting force so that it can rapidly execute its mission. Countermobility operations are required to secure objectives, block enemy forces, and provide flank protection for the exploiting force. Survivability operations are conducted to protect the force with the mission to secure terrain or deny escape routes.

The follow-and-support force initially prevents the enemy from closing the gap in a penetration and secures key terrain gained during the penetration or envelopment. As the exploiting force advances, the follow-and-support force secures LOCs, mops up or destroys bypassed forces, expands the area of exploitation from the axis of advance of the exploiting force, and blocks the advance of reinforcements into the area. Again, the follow-and-support force requires engineer support to accomplish these missions for the same reasons as the exploiting force. Sustainment engineering missions may also be required to keep LOCs and routes open for exploitation forces and sustainment assets.

The engineer force supports an exploitation in similar fashion to an MTC. The major difference is the very limited time available to plan and prepare for the exploitation. Based on the limited plan and preparation time, the engineer force that supports the exploitation is configured from the engineer assets already task organized with the exploiting force.

The division engineer has several responsibilities when the division conducts an exploitation. First, he plans to support exploitations by providing a flexible engineer task organization to the attacking division. The exploitation mission is likely to be assigned to the division's follow-and-support force or its reserve. The division engineer must not ignore the contingency of exploitation operations. He must ensure that the follow-and-support force and the reserve force have sufficient engineer forces to conduct exploitation operations. Second, as with an MTC, the situation is unclear. The division's G2 will rapidly develop information requirements pertaining to the area of interest for the exploitation. This will be used to develop intelligence requests for intelligence-gathering units. The division engineer supports the G2 in this process by quickly providing information requirements for engineer missions. These include locations and size of obstacles and the location of the enemy force covering them, enemy and friendly use of scatterable mines that will impact the mission, the status of specific bridges key to the operation, and the impact of terrain and weather on mobility operations. Third, the division engineer must be sensitive to the sustainment posture of the engineer force supporting an exploitation and ensure, through constant coordination with the DISCOM, that the sustainment requirements are identified and met.

Pursuit

A pursuit is a natural extension of an exploitation. It differs from the exploitation in that its primary function is to complete the destruction of an enemy force that is in the process of disengagement. While a terrain-oriented objective may be given, the enemy force itself is the primary objective. The pursuit generally consists of forces that apply direct pressure and forces that encircle the enemy.

The direct-pressure force prevents enemy disengagement and subsequent reconstitution of the defense and inflicts maximum casualties. To accomplish this mission, the direct-pressure force attacks constantly on a wide front. The division engineer's priority in supporting the direct-pressure force is mobility operations. The direct-pressure force must have the capability to conduct decentralized, in-stride breaching operations. The direct-pressure force performs its secondary missions of enveloping, cutting off, and destroying enemy forces through the use of maneuver and engineers to support mobility requirements. The countermobility and survivability requirements of the direct-pressure force are minimal, although the capability to conduct them as contingencies must be present in the flexible engineer force.

The encircling force's mission is to get to the enemy's rear rapidly, block its escape and, together with the direct-pressure force, complete the enemy destruction. The division engineer's initial priority is to provide mobility support as the encircling force gets into position, then countermobility and survivability to block the enemy force. Due to the nature of the pursuit and its similarities to the exploitation, the engineer planning considerations and actions are the same as those of an exploitation.

OFFENSIVE OPERATIONS: LIGHT DIVISION

Light divisions conduct five types of offensive operations. They are–

1. MTC.
2. HATK.
3. DATK.
4. Exploitation.
5. Pursuit.

FM 71-100 contains a description of each type of offensive operation. The light division applies the basic forms of maneuver and conducts the five types of offensive operations to maximize the division's capabilities and minimize its limitations. The light division's method of operation is to disperse widely throughout a large area and conduct synchronized but decentralized operations. The division conducts offensive operations exploiting the advantages of restricted terrain and limited visibility.

The division engineer must understand the concept of employment of the light division and the principles and organization of each operation. He applies the engineer offensive planning procedures (discussed earlier in this chapter) to develop an appropriate engineer force allocation and scheme of engineer operations to support light division offensive operations.

Movement to Contact

The division conducts an MTC to gain or regain contact with the enemy, limiting the risk to the smallest possible part of the force. The remaining force is then available to immediately respond when contact is made. Once contact is made, the commander can further develop the situation, maneuver and concentrate forces, and conduct an HATK or hasty defense.

The primary consideration in preparing for an MTC is anticipating actions during the movement and requirements for maneuver and fire support once contact is made. During the advance, the commander continually analyzes the situation based on current reports and intelligence. Unit positioning in the formation is dictated by the mission, particularly the anticipated employment of maneuver units.

A light division MTC is best suited against other light infantry forces. The following five principles evolve from a light division's limited mobility and the reliance on restrictive terrain:

- Lead with the smallest force possible that is mobile, self-contained, and task organized to allow it to locate and fix the enemy.
- Task organize to allow the division to react, deploy, and violently attack in any direction.
- Maintain mutually supporting distances between elements to facilitate a rapid response in any situation.
- Move aggressively.
- Execute decentralized.

Light divisions employ two techniques to conduct an MTC: the approach march and the search and attack.

Approach-March Technique. The approach march is the traditional technique for conducting an MTC. Its goal is to develop the situation early, providing the division with a tactical advantage before decisive engagement. The division is assigned an axis of advance (or zone) with objectives designated to orient movement. Objectives are characterized by terrain that is easily recognizable and at a depth that is sufficient to ensure contact.

The movement formation is normally comprised of a covering force, an advance guard, flank and rear security, and a main body. All elements are mutually supporting during movement, ensuring the commander synchronized action at the decisive point and time.

An approach march has several possible outcomes. First, the division may not make contact with the enemy and reach its objective unopposed. The division may then continue the approach march to a subsequent objective or establish a hasty defense. Second, a meeting engagement may occur where the division meets an unexpected moving or stationary force. A meeting engagement will result in a rapid decision to conduct a HATK, hasty defense, or a combination of both. Another possibility is to bypass the enemy force. When the division has a clear picture of the disposition of the moving enemy, the division may exercise a third option. The division may gain the advantage by moving to advantageouss terrain and prepare for a HATK, hasty defense, or a combination that destroys the enemy force. In this third option, the division chooses the ground to fight on and sets the conditions for battle while not in contact. The engineer force must be configured to accomplish the variety of mobility, countermobility, and survivability operations involved in the approach march.

The division engineer must understand the objective of the approach march and all contingencies to the plan. Planning begins by identifying engineer tasks and allocating forces. Figure 3-10, page 3-24, shows the basic engineer tasks required to support a light division approach march.

The division engineer considers each component of the approach march and inherent engineer missions when identifying tasks and allocation of forces. He allocates the necessary forces and assets to accomplish the engineer tasks for the covering force, advance guard, flank and rear guards, and

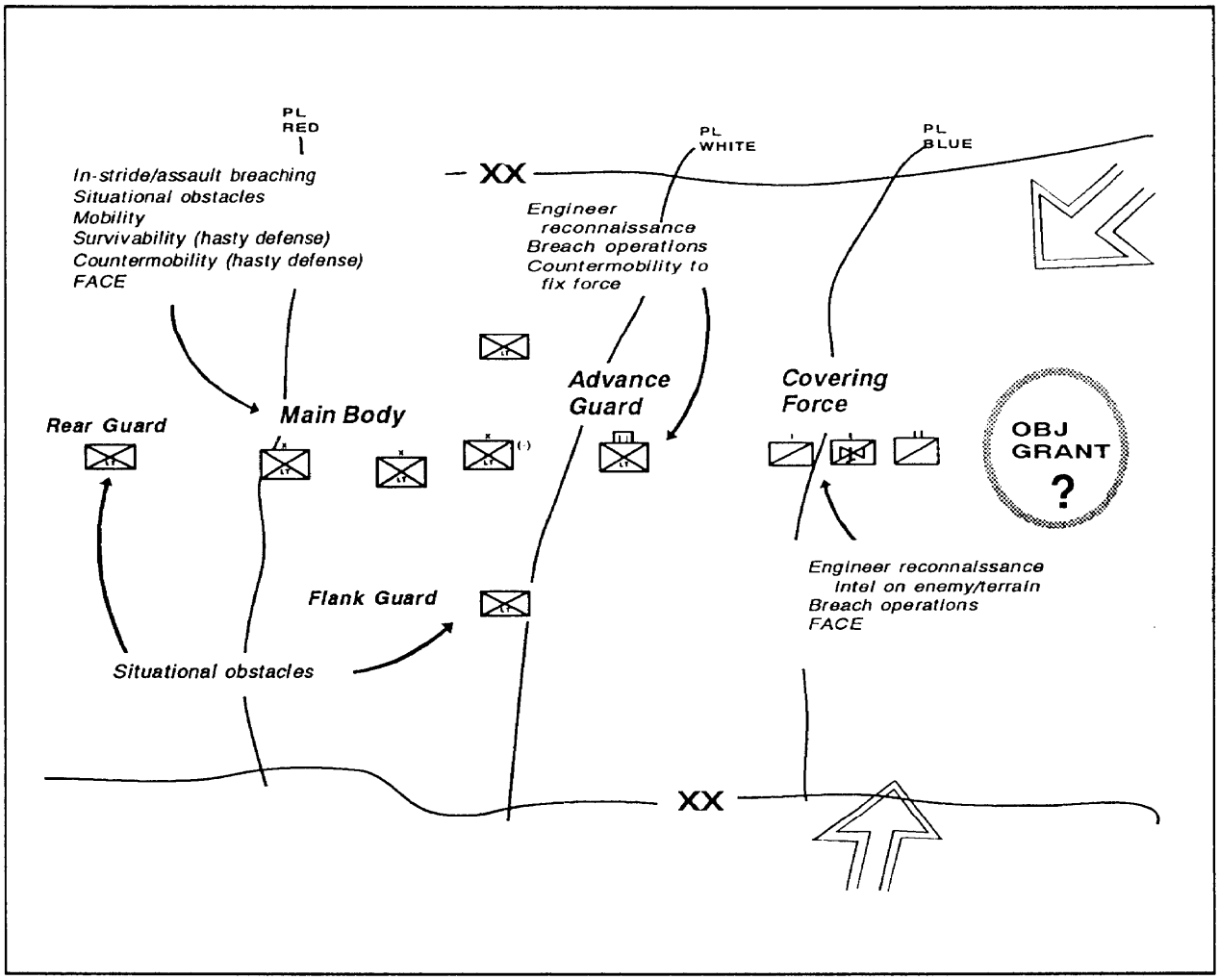


Figure 3-10. Approach march, M/S responsibility

main body. He then task organizes engineer units based on his force allocation, C2 requirements, and minimal changes to the existing task organization.

The covering force develops the situation and prevents unnecessary delay of the main body. In addition, it conducts reconnaissance, destroys enemy reconnaissance elements, secures key terrain, and prevents premature deployment of any elements of the main body. The engineers supporting the covering force assist in reconnaissance to gain intelligence and mobility operations to sustain the freedom of maneuver of the covering force.

Figure 3-10 shows elements of the division CAV squadron as the covering force. Although it has no dedicated engineer support, the division CAV squadron will require engineer support to accomplish its tasks. A division engineer squad or platoon is the appropriate-sized force to allocate to the covering force. If the covering force is a task force from the advance guard brigade, a division engineer platoon provides support for engineer missions.

Engineer support to covering force operations is characterized by early linkup, detailed combined arms planning and rehearsals, and thorough integration into the combined arms team. This is even more important when the CAV squadron is the covering force. The division engineer should incorporate as many division engineer platoons as possible into the training plan of the division CAV squadron, as often as possible.

The advance guard follows the covering force and is normally formed from and controlled by the lead element of the main body. It is organized to fight through small concentrations of enemy resistance, while maintaining the uninterrupted movement of the main body. The continuous flow of accurate and current intelligence from the covering force is key to its success.

Mobility missions in support of the advance guard are obstacle breaching, marking of bypasses, reconnaissance, and limited route-clearance operations. Countermobility support may be required when the advance guard is required to fix the enemy. Terrain and enemy information provided by the covering force to the advance guard ensures a quick response with situational-obstacle execution. Engineer support for mobility and countermobility missions will come from the division engineer company that supports the brigade controling the advance guard.

Flank and rear guards protect the main body from ground observation and surprise attack. They have enough combat power to defeat enemy forces or to delay an enemy attack long enough to allow the main body to deploy. Rear and flank guards move parallel to the main body and within the range of supporting artillery.

Engineers provide countermobility support to flank and rear guards when required. The division engineer has the responsibility to plan obstacle zones and coordinate situational obstacles to protect the division's flanks and rear. Engineer reconnaissance provides recommendations on locations for the optimal employment of air and ground Volcanos. Air and ground Volcanos and rapid-obstacle teams are task organized to execute situational obstacles in support of flank and rear guard forces. Engineer linkup, incorporation into the orders process, rehearsals, and CSS are vital to synchronizing countermobility support.

The division engineer conducts close coordination with the division staff and the commanders of the flank and rear guards. This coordination must determine the type and effect of the obstacle, the NAI/DP, the TAI, the execution criteria, and the maneuver and fire-support forces that will cover the obstacle to gain the combat multiplying effect.

The final element of an approach-march formation is the main body. It contains the bulk of the division's combat power. It is organized to conduct either a HATK or a hasty defense. The march formation of the main body is selected to permit maximum flexibility during movement and upon contact with the enemy. The approach march ends with the occupation of an objective without enemy contact or, when contact is made, in a series of meeting engagements and HATKs. A meeting engagement is the combat action that occurs when the division or elements of the division engage an enemy force, static or in motion, for which it has inadequate intelligence. The action ceases to be a meeting engagement when the enemy's situation is developed and subsequent planned and coordinated operations are undertaken.

Engineers provide mobility, countermobility, and some limited survivability support to the main body during the approach march and subsequent meeting engagement. Mobility operations in support of the main body primarily consist of in-stride breaches with the capability to transition to a deliberate breach. Mobility reserves required for the transition to a deliberate

breach are maintained at maneuver brigade and battalion levels. These are established by weighting the main effort with division engineers or corps engineers.

Survivability support to the main body will normally occur after the main body transitions to a hasty defense as a result of a meeting engagement. Survivability support will be characterized by protection of C2 nodes, fire support, ADA, and possibly critical, crew-served weapons systems. In order to achieve rapid survivability support, the division engineer identifies resource requirements during mission analysis. The division engineer and brigade engineer CPs troubleshoot problems with Class IV supplies and track the critical status of survivability protection levels.

The transition to the hasty defense will require the division engineer to plan for counter mobility support contingencies. Detailed enemy and terrain intelligence will assist in plan development. The hasty defense may be executed after an objective is secured or from the march as a result of or in anticipation of contact with the enemy. Countermobility operations during a hasty defense center around protection of the main body. The division engineer supports hasty defense counter mobility operations through planning, developing resource requirements, and tentative positioning of obstacle zones. Counter mobility priorities and missions are established during mission analysis, ensuring compliance with the commander's intent. Operations are planned for execution either once an objective is secured or from the march. Comprehensive knowledge of the contingency plans (constantly balanced against the developing tactical situation) is imperative, as it drives the allocation of engineer resources to the main body.

The time available to conduct countermobility operations will be limited. Once FRAGOs are received to execute countermobility operations, engineer planners at division level immediately focus their efforts on positioning zones, verifying resource delivery, and monitoring the progress of execution. Synchronization with the combined arms team is key during this time. Guidance from the division commanders and division engineer coordination with fire-support coordinators (FSCOORDs) must be accomplished.

The execution authority for obstacles employed in zones is normally retained at division level. This is done to minimize potential impacts on future operations. Through this process the division engineer ensures the division's flexibility and freedom of maneuver in future operations. He coordinates with the DISCOM for the delivery of obstacle materials in support of these contingency plans.

Figure 3-11 shows an example of engineer force laydown in support of the approach-march technique.

Search-and-Attack Technique. The light division uses the search-and-attack technique to make contact with a dispersed enemy force conducting decentralized operations and to deny the enemy the use of a specific AO. It is most often used in low-intensity conflict (LIC) combat operations. The search and attack will have one of the following purposes:

- Enemy destruction.
- Area denial.
- Force protection.
- Information collection.

In planning and conducting the search-and-attack technique, the division concentrates on the offensive battlefield framework–deep, close, rear, security, and reserve. The principles of attack and corresponding engineer planning considerations are the same as discussed earlier in the chapter (pages 3-2 through 3-5).

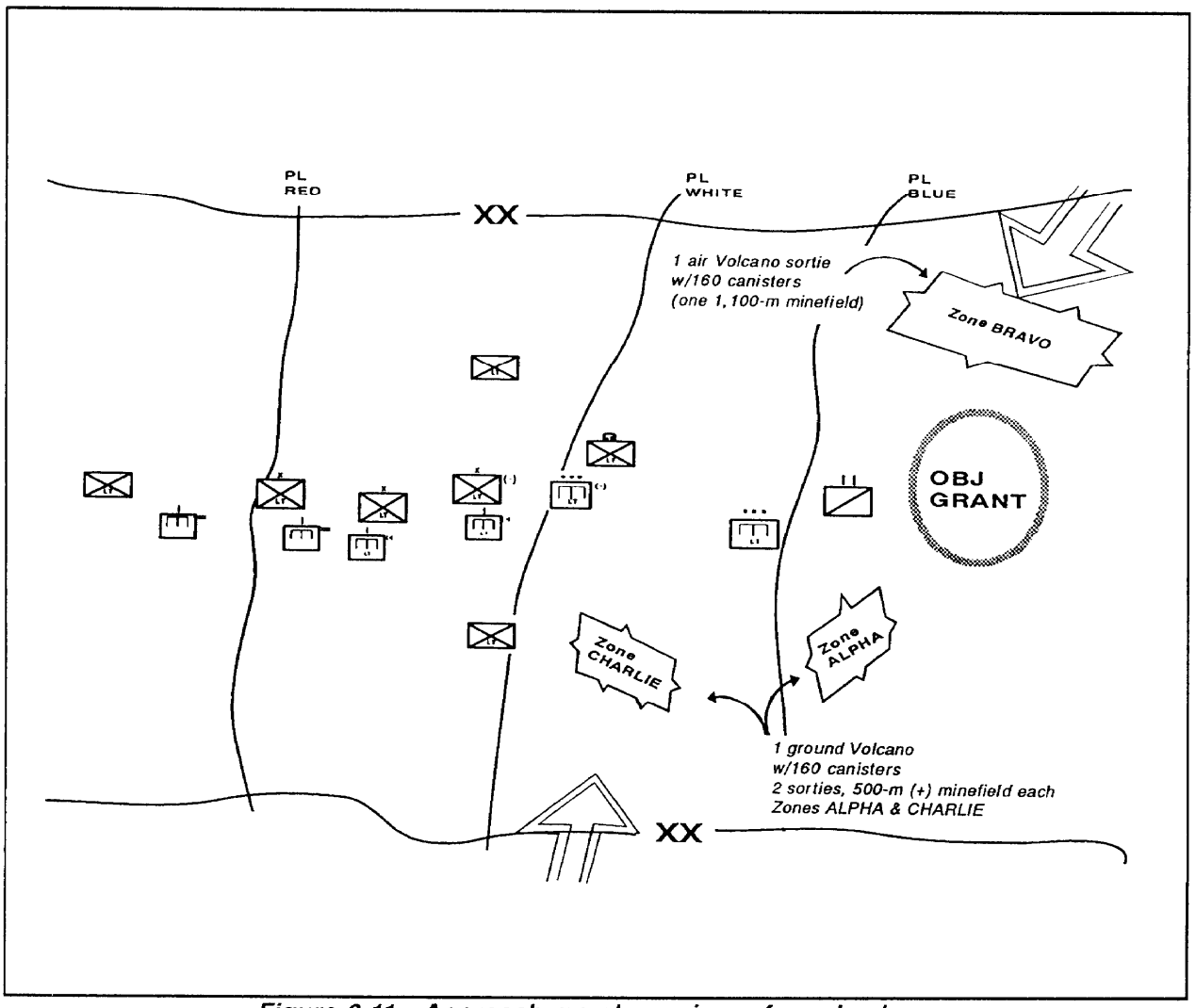


Figure 3-11. Approach march, engineer force laydown

The light division's unique close and rear operational requirements in the search-and-attack technique demand flexible and responsive engineer support. The division engineer must have a thorough understanding of the search-and-attack technique to integrate effectively into close and rear operations as both the engineer planner and unit commander. The division engineer allocates engineers to the brigades primarily to support mobility and survivability requirements in the brigade close fight and rear area operations. Survivability and sustainment engineer support is extensive in the division rear area. The support required often exceeds the capabilities of division engineers, and corps engineer augmentation is essential. Figure 3-12, page 3-28, shows an example of engineer missions in support of a division search and attack.

Division close operations in a search and attack are characterized by small-unit, decentralized combat operations focused on finding and destroying small, dispersed enemy forces. The battalion is the basic operational unit in a search and attack. The brigade assists by ensuring availability of adequate supporting fires; mobile transportation assets; timely, accurate intelligence;

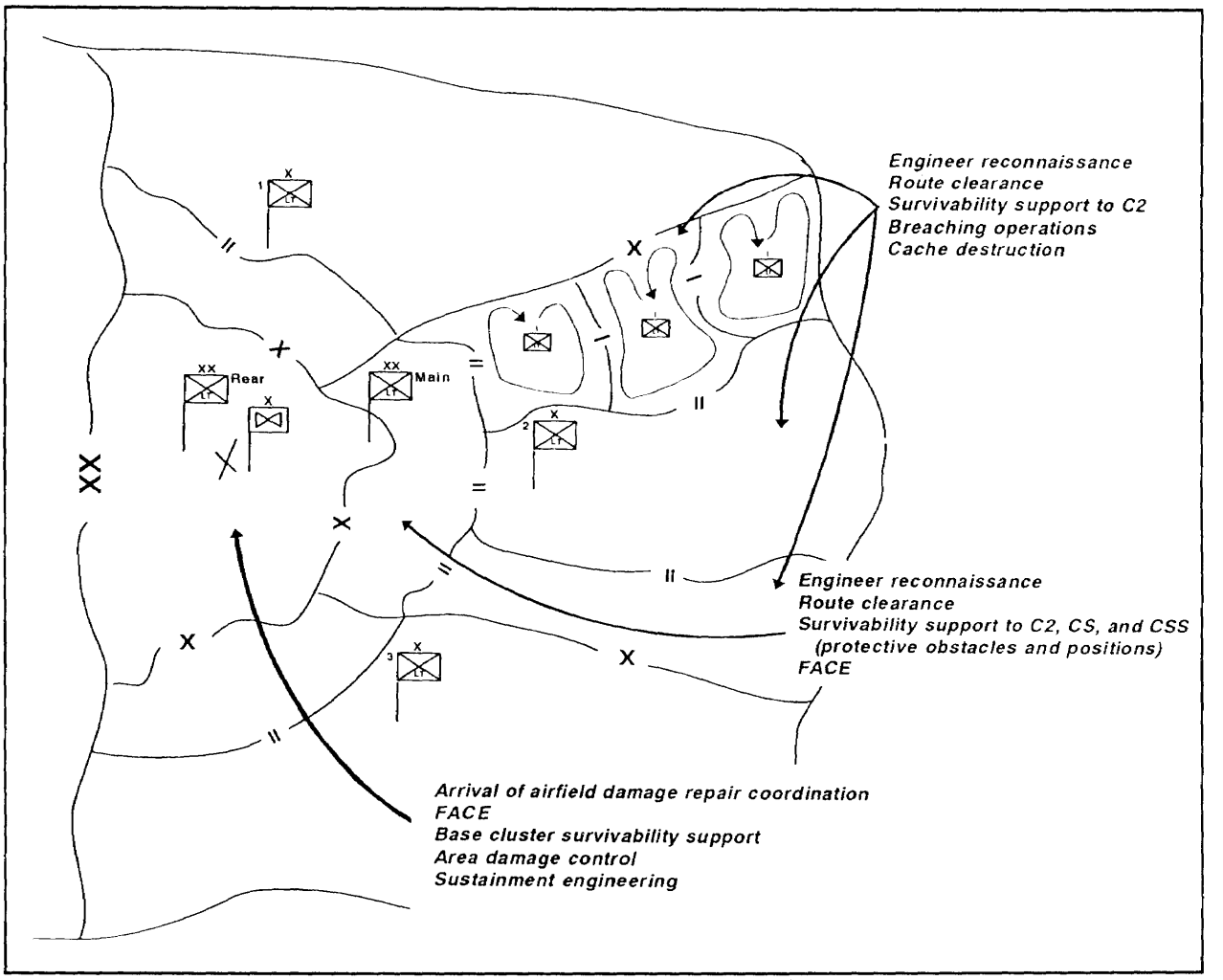


Figure 3-12. Search and attack with M/S missions

and reserve forces. The fighting is done mostly by small units who find the enemy and mass to fix or destroy him. This decentralized technique uses multiple, coordinated patrols to make contact with the enemy. Once contact is made, maneuver and fire support are used to concentrate combat power against the enemy. The enemy is either destroyed, fixed, or kept under surveillance until a larger force arrives.

Engineer force allocation and scheme of engineer operations to support a search and attack are based on the outcome of the engineer estimate and planning process. The division engineer task organizes division engineers to support the light brigades, maintaining the habitual relationships of division engineer companies with their brigades. Division engineer mobility, countermobility, and survivability support to the brigades include–

- Engineer reconnaissance.
- Breaching operations.
- Cache destruction.
- Protective obstacles.
- Survivability in the brigade rear to C2, CS, and CSS.

The brigade task organizes the division engineer company based on engineer mission requirements. The division engineer company may be held under brigade control and provide countermobility and survivability support in the brigade rear. The division engineer company is committed forward when the battalions encounter substantial enemy obstacle systems. Division engineer platoons may be task organized to support the light battalions for use in decentralized. small-scale, mobility missions.

Division rear operations are focused on sustainment of the lodgment area. Enemy forces in LIC combat operations routinely focus their efforts against C2, CS, and CSS assets, avoiding contact with maneuver elements. This situation dictates substantial engineer survivability and sustainment support to protect the force and sustain division lodgment activities. Division engineers are normally task organized to support the brigades conducting search-and-attack operations, and are not equipped to handle the diverse, equipment-intensive tasks involved in rear operations. Therefore, corps assets are required and normally work under the control of the DIVEN commander. The corps assets are tasked with the division rear area missions. The division engineer may allocate corps engineer elements to the brigades to support brigade rear area operations or to reinforce division engineers conducting mobility missions. Figure 3-13 shows an example of engineer force laydown in support of division search-and-attack close and rear operations.

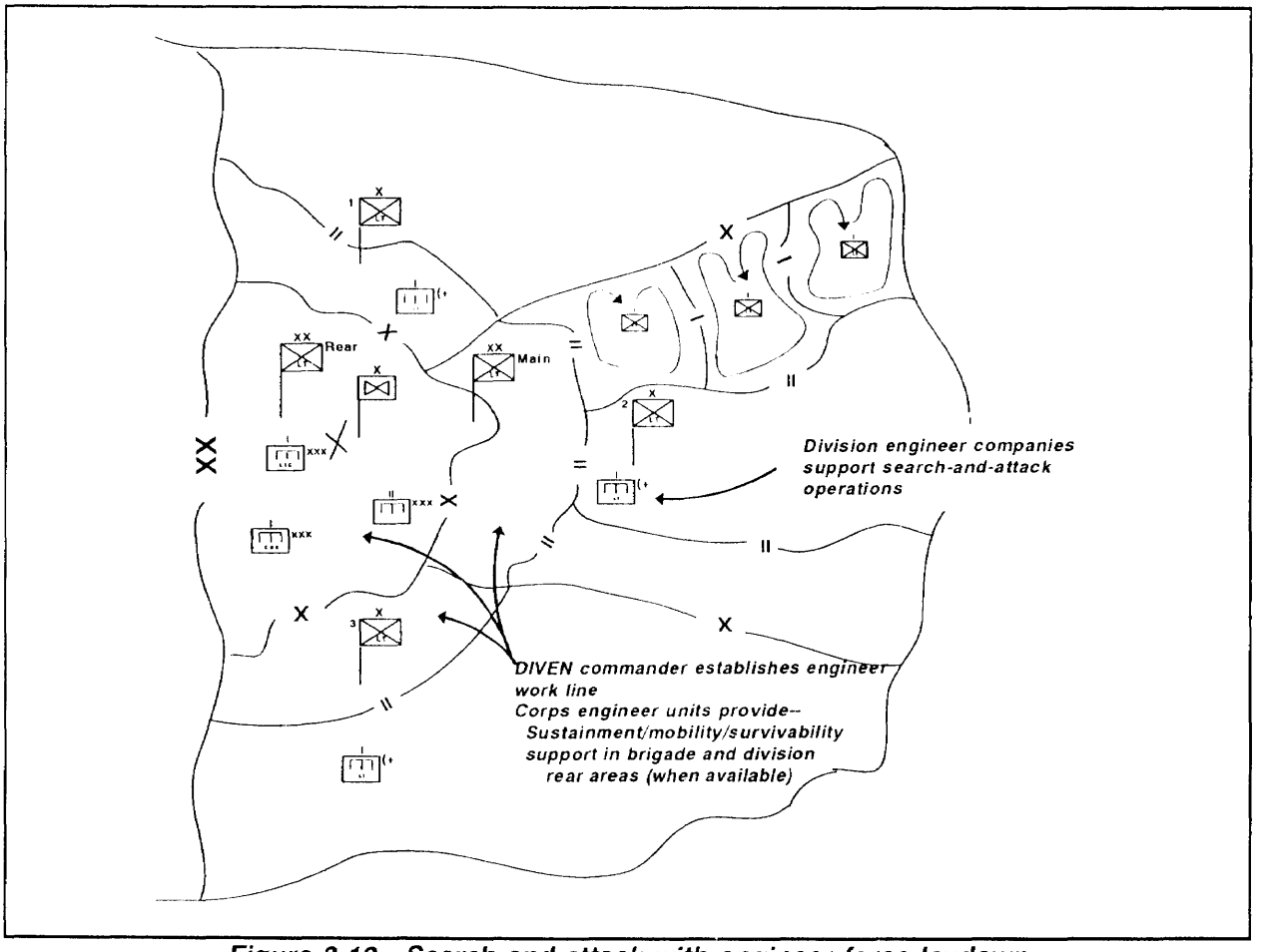


Figure 3-13. Search and attack with engineer force laydown

Engineer missions in the division rear area are–

- Arrival of airfield sustainment, damage repair, and improvement.
- Base cluster protection.
- Area damage control.
- Forward aviation combat engineering (FACE).
- Sustainment engineering (MSR maintenance).

LIC combat operations will routinely require LZs to support the force. Airfield operational concerns center around damage repair, airfield maintenance, and improvement. The division engineer has the responsibility of planning and executing this mission while the airfield is under division control.

Engineer support in the division rear area centers around providing survivability support to protect the force from indirect and direct fires, dismounted attacks, and interdiction operations. Division and corps engineers provide technical expertise to units in this support role, with the supported units often providing the manpower for those missions which do not require equipment support. The division engineer battalion headquarters and headquarters company (HHC) and corps engineers provide the necessary earthmoving assets for this mission.

Sustainment engineering support in the rear areas is essential. MSRs are subject to frequent interdiction by enemy mining and attacks. Corps engineer units such as CSE companies and corps wheeled battalions provide this support. The division rear CP engineer plays a key role in the planning and control of division and corps engineers performing sustainment engineering tasks. Frequent FACE support is also required for the aviation brigade. This engineer support is a critical task, since aviation support is essential to the flexibility of the maneuver commander in achieving mass during a search-and-attack operation.

Hasty Attack

A HATK is normally conducted following either an MTC or a meeting engagement. It can be initiated from a defensive posture or employed as an extension of a DATK. Figure 3-14 depicts a HATK scenario conducted from an MTC. When the division conducts a HATK, it is trading preparation time for speed to exploit the tactical situation. A decisive advantage is achieved by immediately attacking with available resources to maintain the momentum of the attack. The division lead elements may bypass obstacles and small pockets of stubborn resistance, provided they do not threaten the overall success of the attack.

The division engineer recommends the allocation of engineer units required for mobility and counter mobility support to the HATK prior to executing the meeting engagement. He accomplishes several essential tasks parallel to and synchronized with the division plan. He maintains a current and accurate picture of the current close fight; passes timely, engineer-specific information to division planners and brigade engineers; and develops contingency plans and keeps the brigade engineer informed on upcoming tasks. The planning process focuses on potential engineer responses to future operations through the shifting of assets and priorities. A division engineer company normally supports each brigade in a HATK. Each light maneuver battalion requires at least one light engineer platoon for mobility support. This may require a corps light engineer platoon to augment the division light engineer company's two platoons.

The primary engineer mission conducted in support of attacking elements is mobility support. Engineer reconnaissance operations in the lead elements focus on providing specific obstacle locations, bypasses, and types of obstacles. This information is

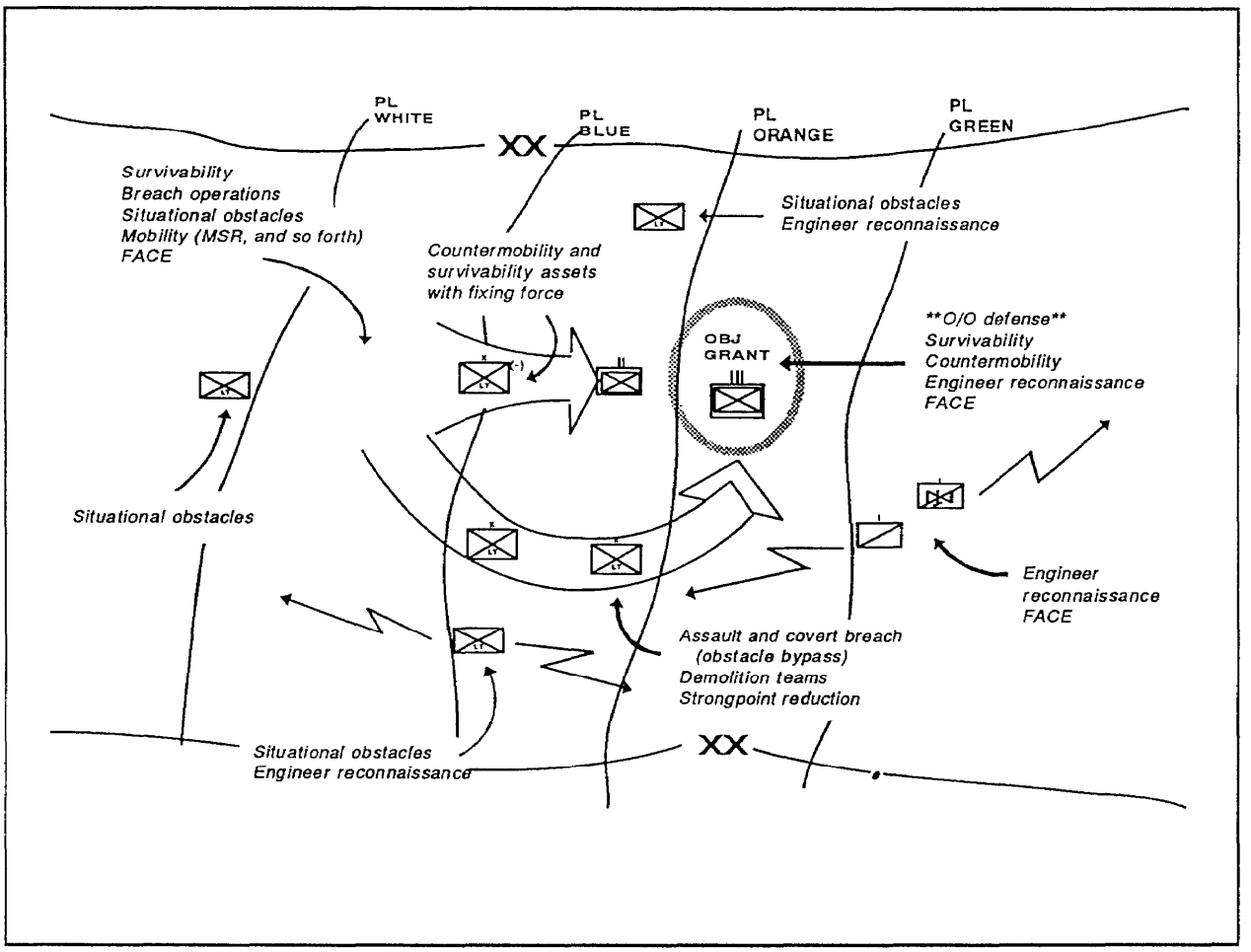


Figure 3-14. HATK, M/S missions

needed by engineers with the main and supporting attacks who must reduce these obstacles. As required, in-stride breaching operations are conducted until the assault takes place. As the attack reaches the objective, mobility operations focus on assault or covert breaching. At the objective, engineers reduce key facilities, structures, and fighting positions as required. Once the objective is secured, engineer support will shift to countermobility operations against counterattacks.

The division engineer plays a key role in recommending obstacle zones that protect the division from counterattack and provide for the continuation of the attack. Countermobility operations will be the focus of security and guard elements. These operations act to isolate the attack from enemy counterattacks, ensuring the maneuver commanders freedom of action and initiative. These operations are characterized by the full spectrum of the family of scatterable mines (FASCAM) system and the employment of select conventional obstacles. These obstacles are positioned at key choke points on enemy ingress and egress routes and can be applied to either a mounted or dismounted force. Fundamental to these operations is an accurate terrain analysis, verified by ground or aerial reconnaissance, and synchronization of all fire-support assets available to the division.

Figure 3-15, page 3-32, shows an example of engineer force laydown in support of a HATK.

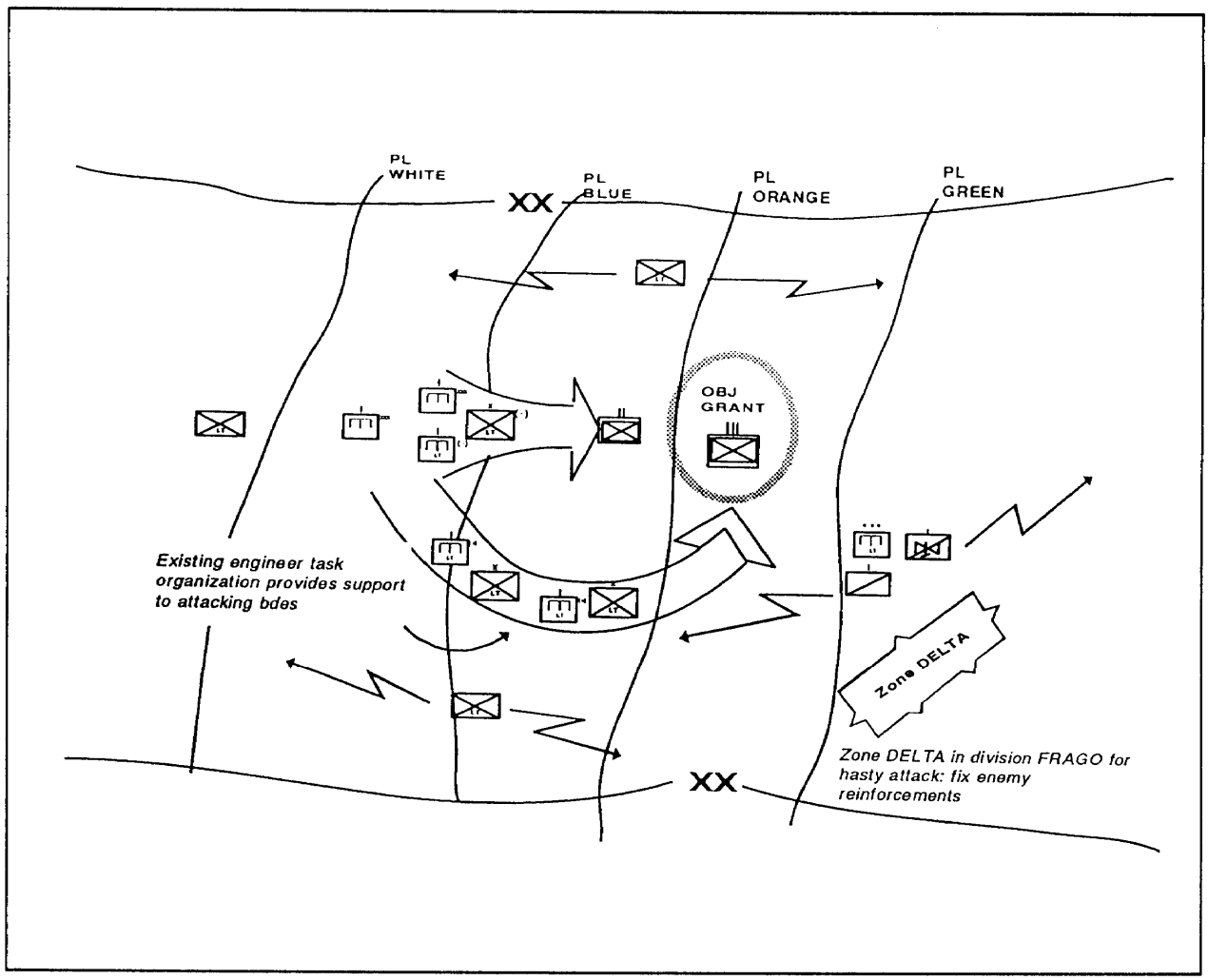


Figure 3-15. HATK, engineer force laydown

Deliberate Attack

The only difference between a HATK and a DATK is the time dedicated to planning, preparation, and coordination prior to execution. The DATK is characterized by thorough, detailed planning; rapid concentration of forces; exploitation of enemy weaknesses; violent execution; early transition to exploitation; and positive, aggressive leadership. It is directed against overcoming a strong enemy in prepared positions that could not be otherwise turned or bypassed. A DATK is only undertaken after a detailed reconnaissance, acquisition and development of targets, and the integrated analysis of all factors affecting the situation.

The DATK normally employs three elements: main effort, supporting effort, and reserve or follow-and-support forces (Figure 3-16). The division is organized in depth to ensure flexibility during execution. Indirect approach methods are commonly used as they serve multiple functions. They protect the force during movement and bypass the enemy's obstacles and concentrated fires.

Engineer responsibilities and mission support to the DATK mirror the HATK, with

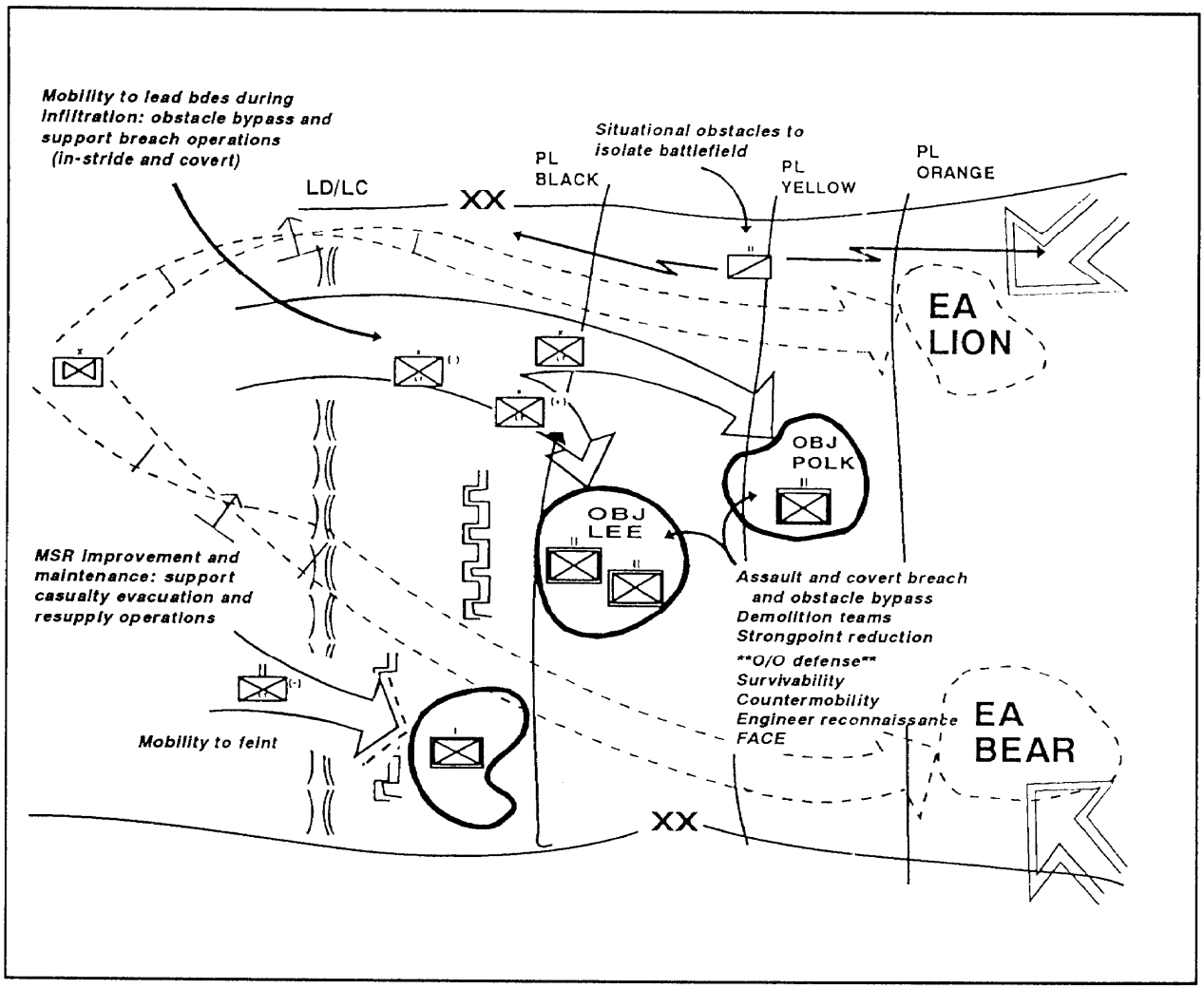


Figure 3-16. DATK, M/S responsibility

more time being available to the division engineer.

Key planning time is dedicated to potential subsequent operations as delineated in the commander's intent and mission statements. Follow-on exploitation, pursuit, defense, HATK, or continued DATKs are war-gamed, planned for, and resourced as required. Similar to the HATK, planning and preparations completed for the DATK will have the biggest impact on subsequent operations. Once the DATK is underway, the division engineer will not have time to significantly influence its continuation.

Figure 3-17, page 3-34, shows an example of engineer force laydown in support of the DATK.

Exploitation and Pursuit

Exploitation is the rapid continuation of a successful attack to maximize success and take advantage of weakened or collapsed enemy defenses. It is planned as an integral part of the attack, with tentative objectives, forces, and zones identified for the exploitation. Its purpose is to prevent the enemy from reconstituting his defenses and forces; deny his withdrawal; and secure and destroy

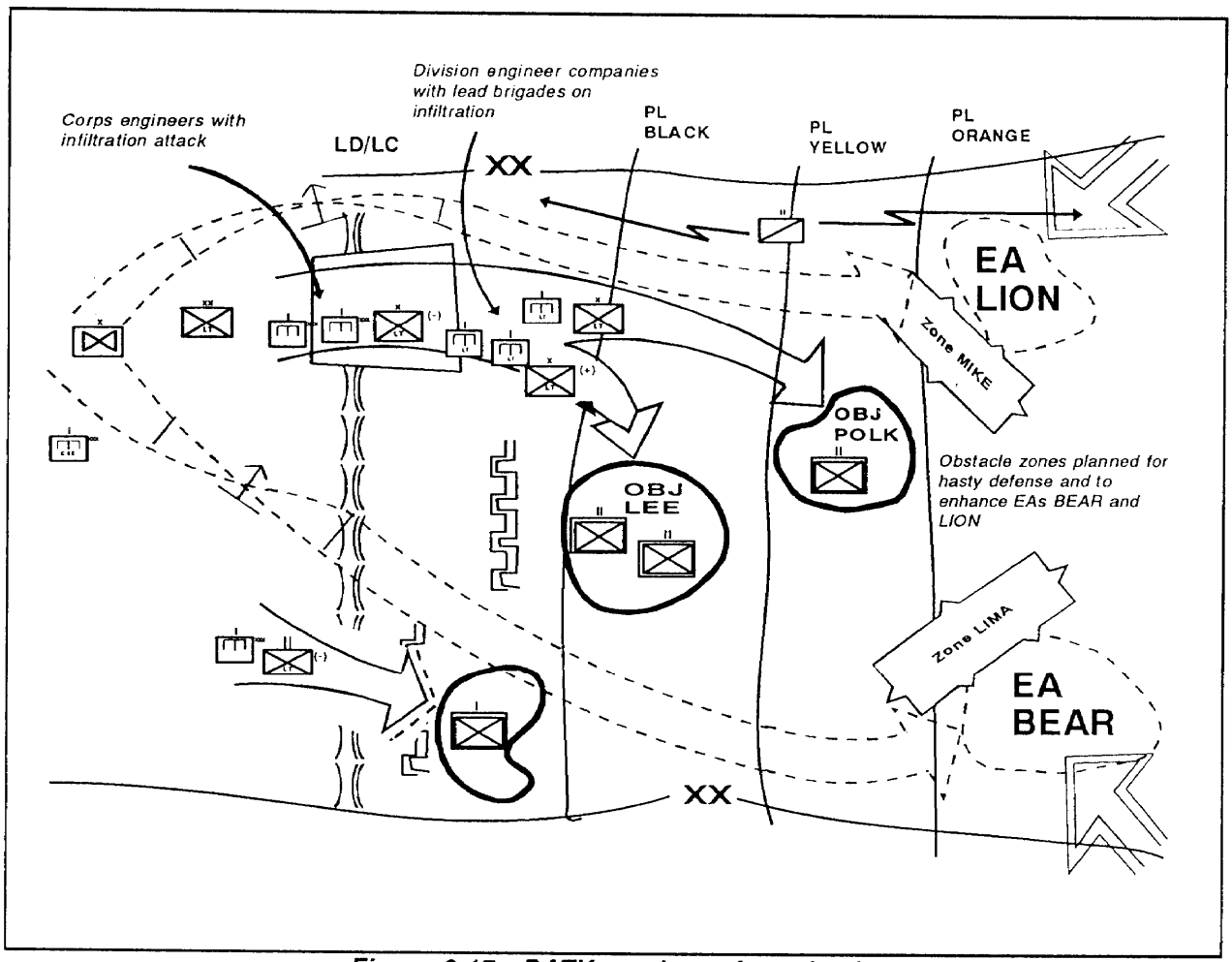


Figure 3-17. DATK, engineer force laydown

deep forces, C2 facilities, and objectives. Minimum control measures are used in the DATK, giving maximum latitude to subordinate commanders. Knowing that C2 will be initiated from the front of the formation rather than from the rear is key to understanding the C2 of an exploitation and the planning and preparation that precede it.

The pursuit is an extension of the exploitation resulting in the relentless destruction or capture of fleeing enemy forces. Light divisions normally conduct pursuits against a similar force, although the division or subordinate elements can be part of a corps pursuit directed against any type of force. In this role, light forces, especially airborne and air assault, are used to envelop enemy rear guards and expedite their destruction. Pursuits are comprised of two forces, the direct pressure and the encircling force.

Engineer responsibilities in support of exploitation and pursuit operations require a decentralized command and a clear intent to be successful. The division engineer best supports these operations through detailed planning subsequent to their execution. Comparable to the HATK, he is limited in his ability to shift engineer assets or change task organizations during their conduct. The previous task organization of the majority, if not all, of his assets to the forward elements will significantly reduce any flexibility to support other missions.

Contingency planning and logistic resourcing is a significant part of the division engineer's influence on these operations. Understanding the division commander's intent as it applies to the attack, subsequent exploitation, and pursuit will focus the division engineer on the engineer responsibilities that must be addressed and resourced. Continual monitoring of the close, current fight of both forces will indicate where resourcing priorities can change and will allow the division engineer to influence immediate future operations. For example, once the pursuit force has completed its encirclement and is in position to transition to a defensive posture, the resourcing of situational obstacles and survivability assets to the force will be developed and executed on order.

Mobility will be the primary mission of engineer assets with direct-pressure forces. These forces must maintain contact with the enemy to deny him the ability to disengage. This force must have the capability to use all available roads, trails, or corridors. Generally, any obstacles encountered will be hasty in nature unless the pursuit follows through a previously prepared defensive area. At every opportunity, direct-pressure forces envelop, cut off, and destroy enemy elements. Enemy objectives and the destruction of equipment and material (if not used by the attacking forces) will be key engineer missions during these operations. This serves to deny any use of these assets by bypassed enemy forces.

To be effective, the encircling force must have greater mobility than the retreating enemy. It must maintain a rapid rate of advance to allow it to get behind the enemy and block his escape so that he can be destroyed. Air assault and airborne forces are particularly effective in this role. The force advances parallel to the enemy's line of retreat to secure defilades, communication centers, bridges, and other key terrain ahead of the enemy main force. Mobility efforts are used only to clear enough zone to allow the force to advance.

CHAPTER 4

DEFENSIVE OPERATIONS

The main purpose of the defense is to defeat an enemy attack. While military operations focus on maintaining the initiative through offensive action, the defense is an inherent part of any offensive operation. The defense is only a temporary state to facilitate offensive action. The division uses the defense to gain time for force buildup or to economize forces in one sector while massing forces for an attack in another. Likewise, a division may use defensive operations immediately following a successful attack to secure its objectives, develop the situation further, rebuild combat power, or deal the enemy a final, decisive blow. In any case, the defense is a critical means to successful division offensive operations. Therefore, it is imperative that engineers understand the art of the defense.

Division and corps engineer forces play a vital role in giving the division a decisive edge while conducting the defense. Engineers must understand the characters tics of defensive operations and how they apply to engineer operations. They must also appreciate how both engineer forces and missions integrate into the division's defensive framework. The engineer estimate process remains as the base planning tool for integrating into division defensive plans. While the process remains the same, each step is tailored to the needs of defensive planning. These fundamentals of engineer integration into division defensive operations are equally applicable to armored or light divisions.

The unique nature of engineer support to armored or light divisions differences in their respective tactics, engineer organizations and capability, and METT-T. Later sections in this chapter are dedicated to engineer support of armored, light, and mixed division defensive operations. These sections use the defensive framework to establish a force-tailored foundation for engineers support to the security force; the MBA; and the reserve, deep, and rear operations.

CHARACTERISTICS OF DEFENSIVE OPERATIONS

To effectively support a defense, engineers must understand the four distinct characteristics of the defense and their relationship to engineer operations. Characteristics of division defensive operations are–

- Preparation.
- Disruption.
- Concentration.
- Flexibility.

Preparation

Defensive operations have a distinct preparation phase which is vital to the division's success. The defender arrives on the battlefield first and is afforded the opportunity to choose his ground and set the conditions for the battle. Engineer functions and forces are a critical component in setting the conditions for combat and giving the division the edge against an attacker.

The success of engineers in the preparation phase depends largely on the ability of the division engineer to conduct integrated planning with the division staff and parallel planning with subordinate unit staff engineers. The division engineer uses engineer channels to disseminate the information and intent needed to foster early planning at all levels.

At the division level, engineer planning and preparation must provide centralized focus for the defense, while allowing decentralized integration and execution. The division engineer uses the scheme of engineer operations, obstacle capability and control, and survivability guidance to focus the division's subordinate unit's engineer efforts. The division engineer resources subordinates through task organization and the allocation of Class IV/V (obstacle) supplies. This allows subordinates to anticipate limitations on their capabilities and prioritize and rapidly identify shortfalls in resources.

Engineer participation in division preparations is not limited to the close operation in the MBA. The division engineer considers the full range of engineer requirements of the total defensive framework: deep, security, MBA, reserve, and rear operations. Each element of the defensive framework is considered during engineer mission analysis and accounted for in the division scheme of engineer operations.

Disruption

The division defense includes a focused attempt to disrupt the enemy effort through deep, security, and deception operations. The division engineer works closely with the division staff to ensure that engineer functions are integrated into deep operations. For example, the division engineer may nominate deep targets that directly attack the enemy's engineer capability. Likewise, the division engineer ensures that engineer aspects of deep and MBA operations are mutually supportive. Engineers provide the security force with the countermobility needed to disrupt the enemy's attack early and the mobility it needs to fight a fluid battle. Deception can play a major role in disrupting the enemy's attack by targeting the enemy's decision cycle. Deception operations can employ a combination of forces and obstacles that cause the enemy to commit combat power prematurely or against a strength perceived as a weakness.

Concentration

In the defense, the division concentrates forces to exploit or create an enemy weakness. Engineers support the concentration of combat power by employing obstacles, constructing fortifications, and providing mobility to counterattack or reserve forces. The principal role of engineers is normally in the employment of tactical obstacles. Engineers employ tactical obstacles to support the scheme of maneuver and directly attack the enemy's maneuver. Tactical obstacles are integrated with the defender's fires to disrupt, turn, fix, or block enemy maneuver, concentrating combat power to create and exploit a weakness. Engineers also construct fortifications and protective obstacles to give the force an edge over enemy fires and to break an enemy assault. Defending from survivable positions is vital to maintaining concentration until the attacker is destroyed. Finally, engineers provide mobility to counterattack forces and reserves to allow the division to take offensive action and exploit a broken enemy attack.

Flexibility

Flexibility is a critical characteristic of division defensive operations. The division must retain the flexibility to employ counterattack and reserve forces and operate within the enemy's decision cycle. Engineers assist the division in maintaining flexibility through situational obstacles in the MBA, task organizing for rapid transition to the offense, and improving or maintaining the routes needed to shift forces. Engineers plan the use of situational obstacles in the MBA as *be prepared* missions that allow the

commander to react to the enemy's attack. Situational obstacles can be employed by themselves or to reinforce the existing effort. The division engineer must recognize the mobility requirements inherent in maintaining the flexibility of division reserve and counterattack forces. He plans for mobility by task organizing engineers with these forces, controlling the division obstacle effort (obstacle control measures), and anticipating rapid transitions to the offense.

DEFENSIVE PATTERNS

Division defensive operations generally take one of two traditional patterns: mobile and area defenses. The fundamental difference between these patterns is their focus-and-defeat mechanism. The scheme of engineer operations to support division defensive operations is tailored to the type of defense. The focus of engineer effort, unit missions, and task organization are all inseparably linked to the focus-and-defeat mechanism of each type of defense. Therefore, the division engineer must understand the area and mobile defense and their implications on engineer functions and unit operations.

Mobile Defense

The focus of mobile defense is the destruction of the enemy attacker. The mobile defense is organized to permit the enemy to advance into a position which exposes him to counterattack and envelopment by a mobile reserve. Therefore, the mobile defense trades space and time for achieving a decisive advantage against the enemy. The defeat mechanism is a large, mobile reserve which must have combat power and mobility equal to or greater than the targeted force.

The division engineer must understand the implications of a force-oriented defense on both engineer functions and operations (Figure 4-1, page 4-4). Engineer support to the mobile defense concentrates on using obstacles to attack enemy maneuver and preserving the mobility of the friendly force. Obstacle planning is more closely linked to the enemy's most probable maneuver course of action than to terrain. It must support attacking the enemy's maneuver in a way that supports his destruction by counterattack. Consequently, obstacle planning is more restrictive than permissive and reduces the flexibility of the brigades. This serves to mass brigade obstacle effort at critical areas and preserves the mobility of the counterattack force in the MBA.

Survivability effort is also tailored to a force-oriented defense that trades space and time for creating an enemy weakness to exploit by counterattack. To create the conditions for counterattack, the brigades must fight the depth of their sectors from multiple primary and subsequent battle positions. Fortification efforts support fighting quick engagements from multiple positions by providing primary and alternate hull-defilade fighting positions in both primary and subsequent battle positions. The nature of the fight reduces the overall need for protective obstacles throughout the defense. Protective obstacle effort is concentrated in final subsequent positions where the penetration must be blunted to allow counterattack.

The defeat mechanism of the mobile defense is the counterattack by a large, mobile reserve with combat power and mobility superior to the targeted enemy force. The division engineer supports the mobility of the mobile reserve in two ways. First, he uses obstacle control measures to ensure that brigade obstacle efforts do not limit the mobile reserve's freedom to maneuver. Second, he ensures the mobile reserve has

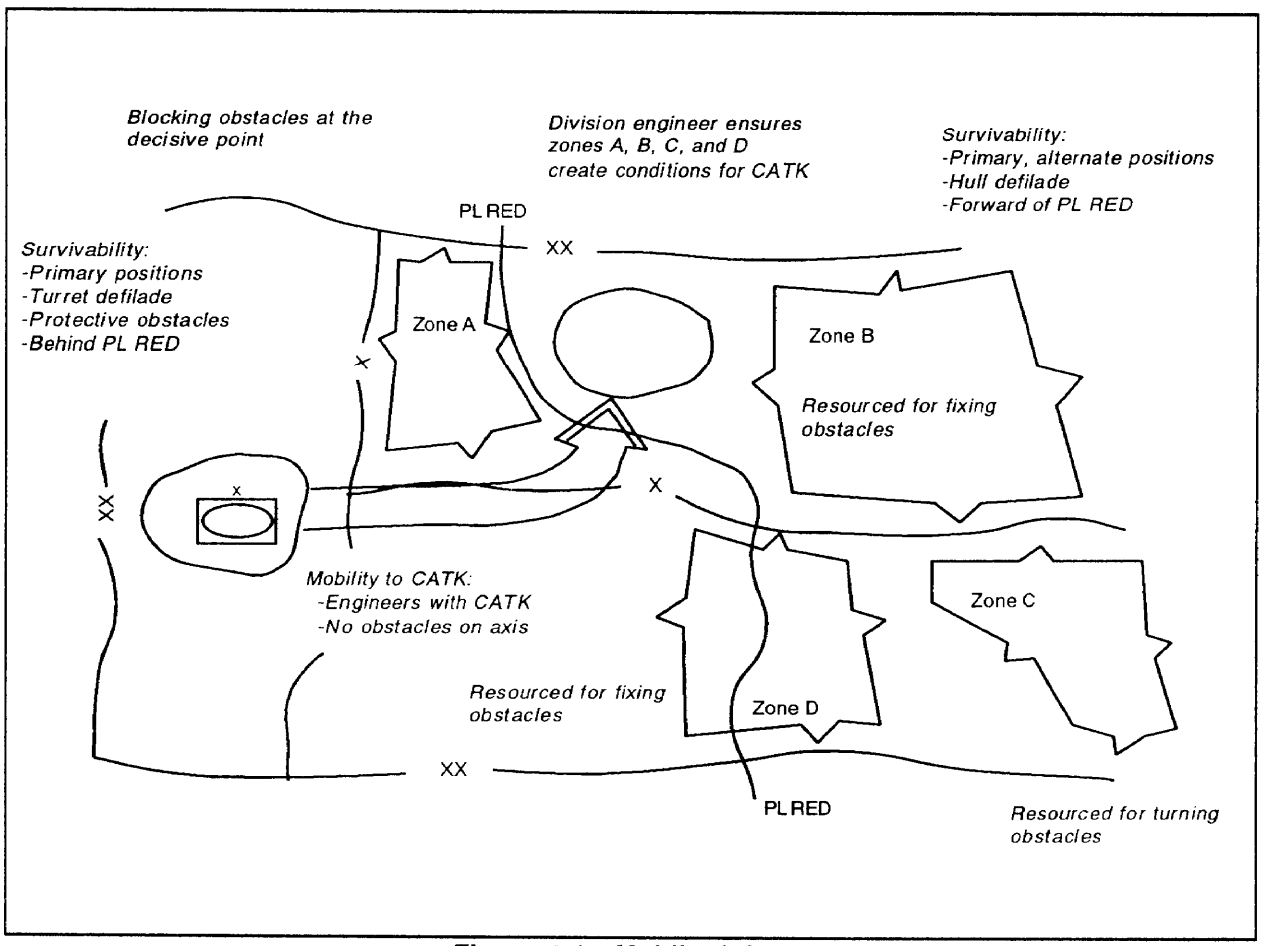


Figure 4-1. Mobile defense

the necessary dedicated engineer support to maintain its mobility during the counterattack. It must be able to counter the enemy's offensive use of obstacles or reduce friendly obstacles as required by changes in the situation. Above all, the counterattack cannot be stalled by a lack of mobility. The division engineer must weigh the trade-offs between dedicating engineer forces to the counterattack and the obstacle and survivability requirements of the MBA.

Area Defense

The focus of the area defense is on the retention of terrain. The area defense is organized to absorb the enemy into an interlocked series of positions from which he can be destroyed. In this pattern, the defeat mechanism is the interlocking nature of defensive positions and small mobile reserves within subordinate defenses to defeat local penetrations. The area defense does not promise outright destruction of the attacker and may require other simultaneous or subsequent operations to achieve a decisive defeat of the enemy.

The division engineer must understand the implication of the area defense on M/S requirements and engineer operations (Figure 4-2). Likewise, the scheme of engineer operations orients on the retention of terrain and on enabling the division to concentrate fires from fixed positions. The location of key and decisive terrain plays a major role in organizing the area defense and becomes the focus of obstacle and survivability effort.

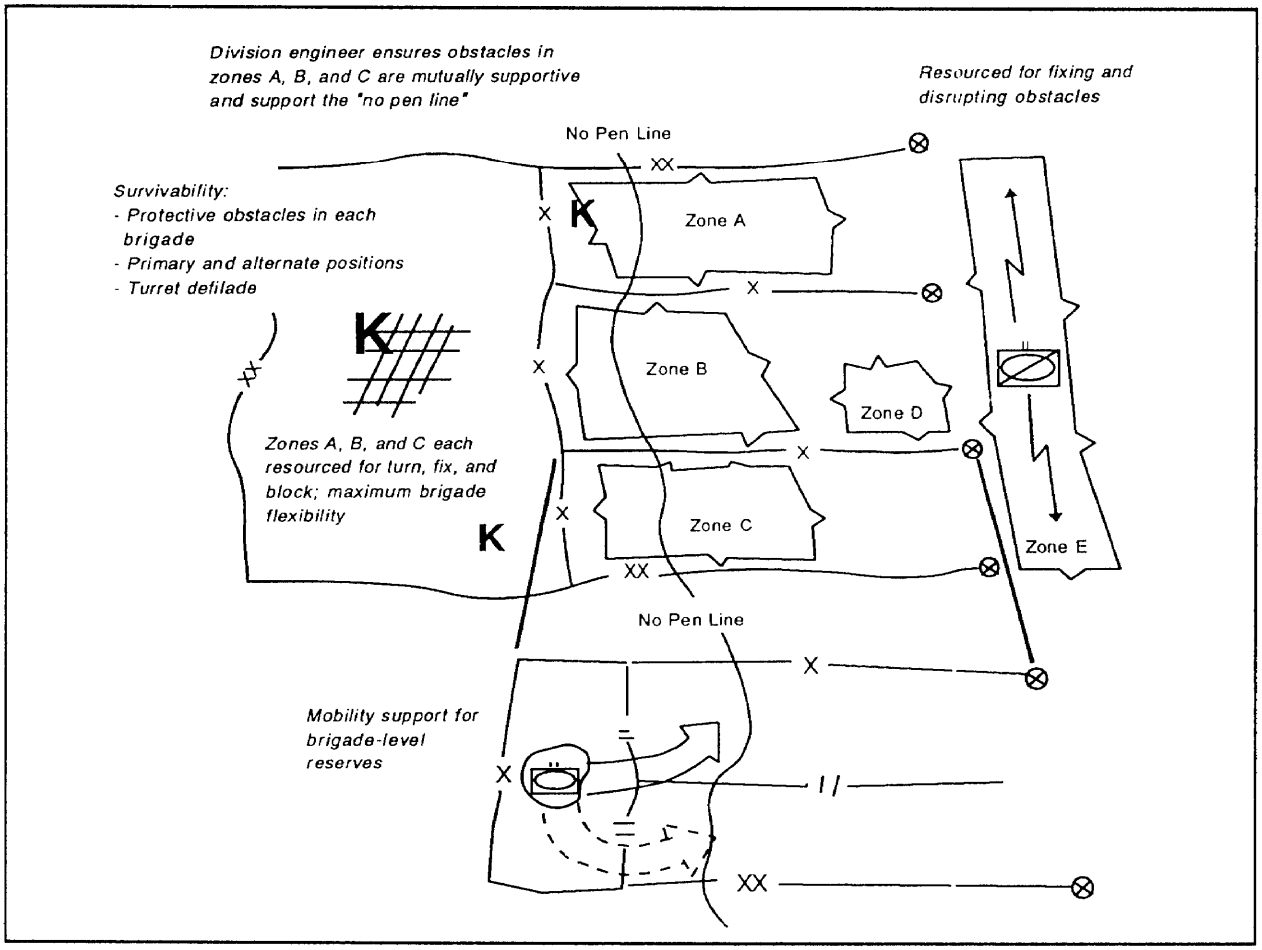


Figure 4-2. Area defense

Division obstacle planning uses obstacle control measures to give maximum flexibility to the brigades while still focusing tactical obstacle effort around the retention of terrain.

Survivability effort must enable brigades to concentrate fire power from fixed positions. The division engineer must be sensitive to the increased fortification needs of the brigades in a division area defense. To fight from more fixed positions, the brigades may require primary, alternate, and supplementary turret-defilade positions. This is partitularly true of brigades defending decisive terrain. The increased requirement for survivability also entails heavier employment of protective obstacles to break the attacker's assault.

Interlocking defensive positions and small, decentralized, mobile reserves are two key components of the defeat mechanism which the division engineer must consider during planning and preparation. He must ensure that the tactical obstacle effort of adjacent brigades is coordinated and mutually supporting and achieves an interlocking defense. Additionally, he ensures that the engineer task organization provides the brigades with dedicated mobility support of their respective mobile reserves.

ENGINEER PLANNING FOR DEFENSIVE OPERATIONS

The engineer estimate provides the planning framework for the division engineer in supporting a division defensive operation. However, the engineer estimate steps focus on different considerations that are peculiar to a defensive mission. See Figure 4-3 for typical examples. This tailored application of the engineer estimate ensures the proper integration of engineer functions into the division's tactical planning process.

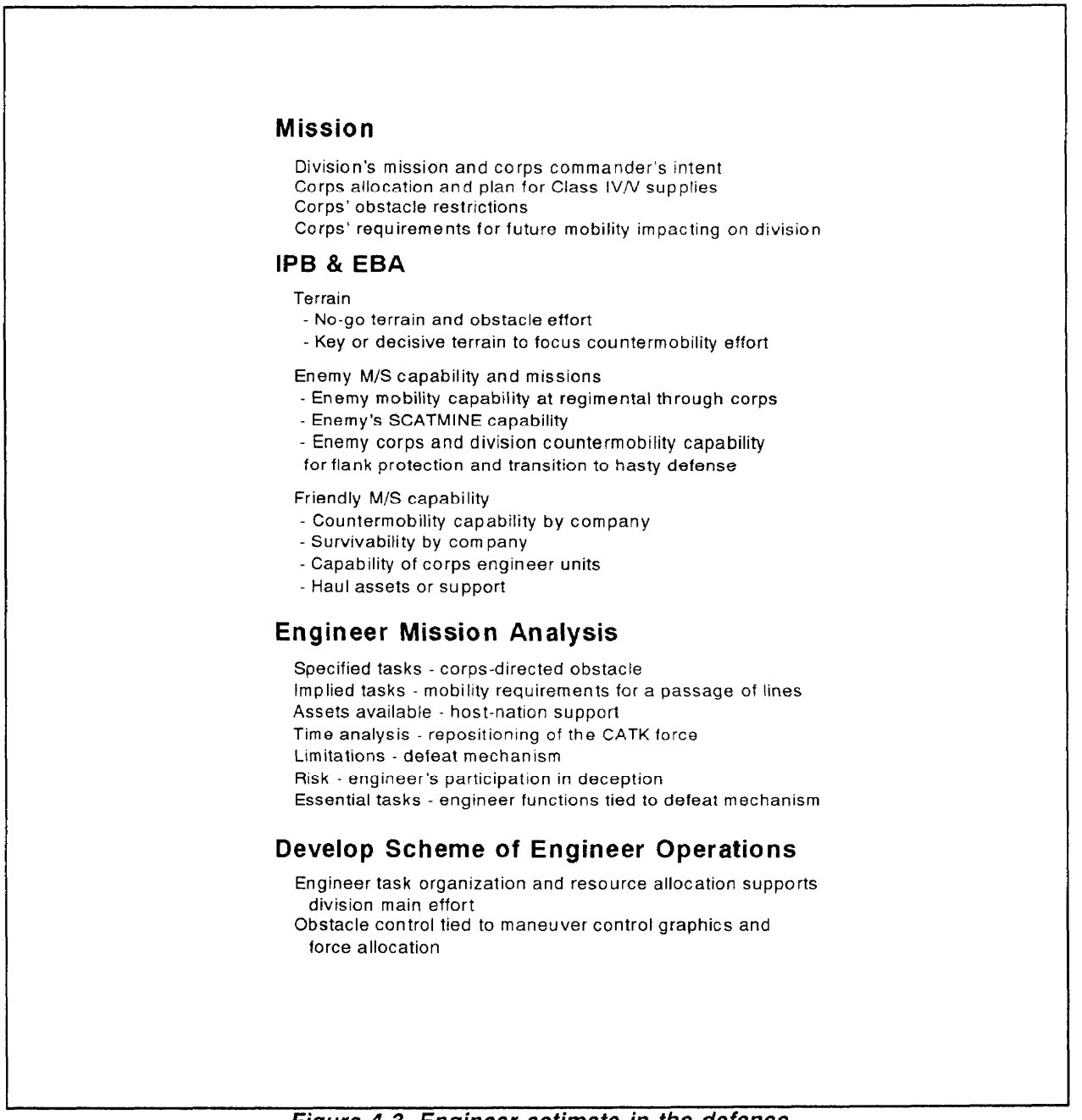


Figure 4-3. Engineer estimate in the defense

The role of the division engineer involves identifying missions, allocating resources, and synchronizing and controlling engineer functions. By the nature of the defense, countermobility and survivability are the primary missions that drive engineer force, resource allocation, and synchronization. Therefore, planning for counter mobility and survivability consumes the majority of the division engineer's time. The engineer estimate process incorporates the obstacle planning process. The obstacle planning process does not preempt the use of the engineer estimate. The engineer estimate provides the total integration of engineer functions (mobility, countermobility, surviability, topographic, and sustainment engineering) into the division planning process.

The challenge of a defending force is to strip away the enemy's initiative and create exploitable vulnerabilities. The answer to this challenge is obstacle integration. The synchronization of indirect and direct fires and tactical obstacle effects is crucial to being successful. Obstacle control, intent, and resourcing are top-down driven, while obstacle integration with fires is generally bottom-up. The obstacle planning process provides the foundation for this integration. The obstacle planning process steps are listed below:

1. Situation analysis.
2. Organization of the operation.
3. Mobility and future operations requirements.
4. Obstacle resourcing.
5. Scheme-of-obstacle overlay.

Figure 4-4 shows the interrelationship of the obstacle planning process and the

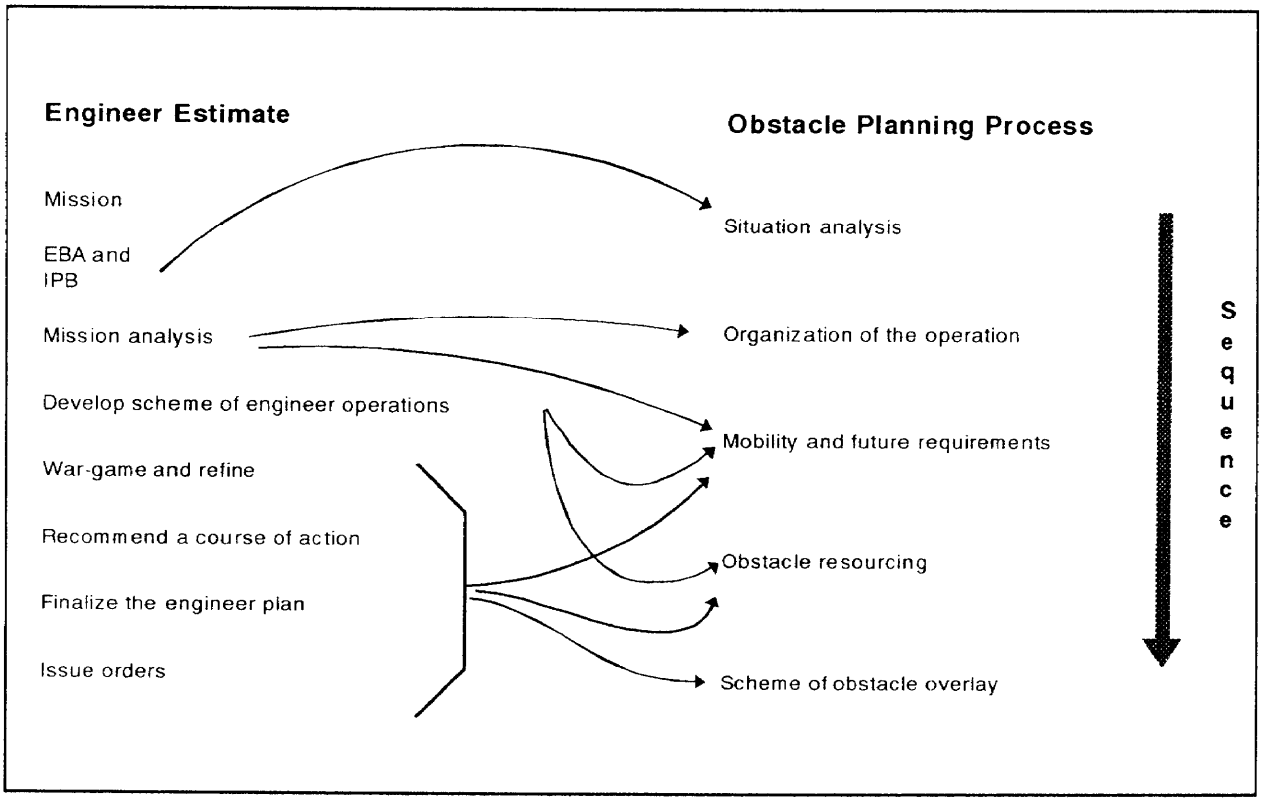


Figure 4-4. Engineer estimate and obstacle planning process

engineer estimate. Before the obstacle planning process can be discussed, the echelons of obstacle planning and obstacle control principles must be understood.

Echelons of Obstacle Planning

Specific obstacle synchronization techniques and control measures are relative to maneuver planning levels–division, brigade, and task force or battalion. Divisions, brigades, and task forces plan obstacle zones, belts, and groups, respectively. In some cases, corps may designate obstacle zones to division. Normally, obstacle zone planning is initiated by division. These obstacle control measures permit tactical obstacle placement and focus subordinate units in their tactical obstacle effort. The obstacle control measures not only focus obstacle effort for subordinate maneuver commanders on specific areas of the battlefield but can provide guidance on the specific obstacle effects (disrupt, turn, fix, and block) on the attacking enemy. This additional guidance is provided by obstacle intent. Refer to Figures 4-5 and 4-6, page 4-9, for a summary of the echelons of planning and a sample graphic portrayal. Before discussing the functions of obstacle zones, belts, groups, and individual obstacles, obstacle intent must be defined.

Obstacle Intent. Designating the obstacle effect—disrupt, turn, fix, or block—is not enough to synchronize fires and obstacle effort or to complement the scheme of maneuver. In order to focus the entire force, the maneuver commander and his supporting engineer designate an obstacle intent. Obstacle intent describes how, in terms of obstacle effects, the commander will use tactical obstacles to effect the enemy's maneuver to the advantage of his fire plan (direct and indirect). The obstacle intent establishes a direct link with the obstacle and fire plans. To accomplish this integration and synchronization, obstacle intent contains three components: an obstacle effect, a target, and a relative location on the battlefield.

The *obstacle effect* is conveyed through the use of precise graphics. Figure 4-7, page 4-10, depicts the obstacle-effects graphics. The maneuver commander and staff engineer must understand the flexibility of these graphics. Each symbol represents exactly how the enemy's maneuver should be altered. For example, a turn symbol points to the desired direction for the enemy formation to follow. Refer to Figure 4-8, page 4-11, for examples of how obstacle belts alter the enemy's formation through the use of obstacle groups.

A *target* refers to the enemy whose ability to maneuver is the target of the obstacle and fire plans. The target is relative to the subordinate unit's force allocation ratio. An armored maneuver brigade conducting a prepared defense will normally fight an enemy division. Maneuver battalions and companies in a prepared defense will fight an enemy's brigades or regiments and battalions, respectively.

The *relative location* of the battlefield refers to the use of obstacle control measures. Figure 4-6, page 4-9, depicts the relative locations for each planning echelon. Obstacle zones and belts use an enclosed, unspecified obstacle symbol. Obstacle groups use the obstacle-effect symbol alone on the exact terrain where direct and indirect fires will be integrated and synchronized with individual obstacles.

The obstacle intent's components enable the force to focus, integrate, and synchronize combat power with obstacles. A fully developed obstacle intent brings together–

- The situation template, by defining the target.

Planning Echelon	Obstacle Control Measure	Obstacle Intent
Division	Zones	Optional
Brigade	Belts	
Task Force	Groups	
Emplacing Unit	Obstacles	Mandatory

Figure 4-5. Echelons of obstacle planning

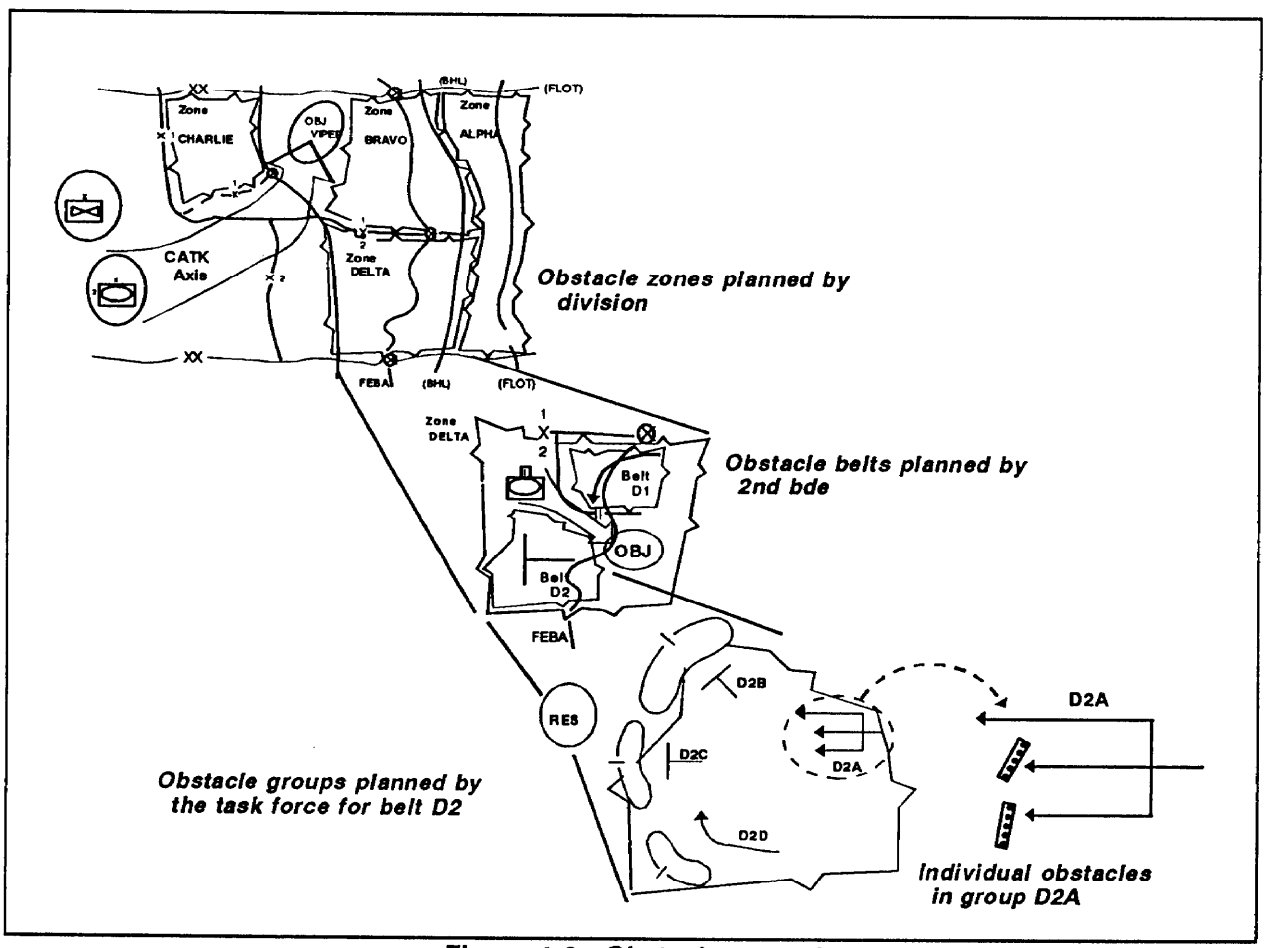


Figure 4-6. Obstacle control

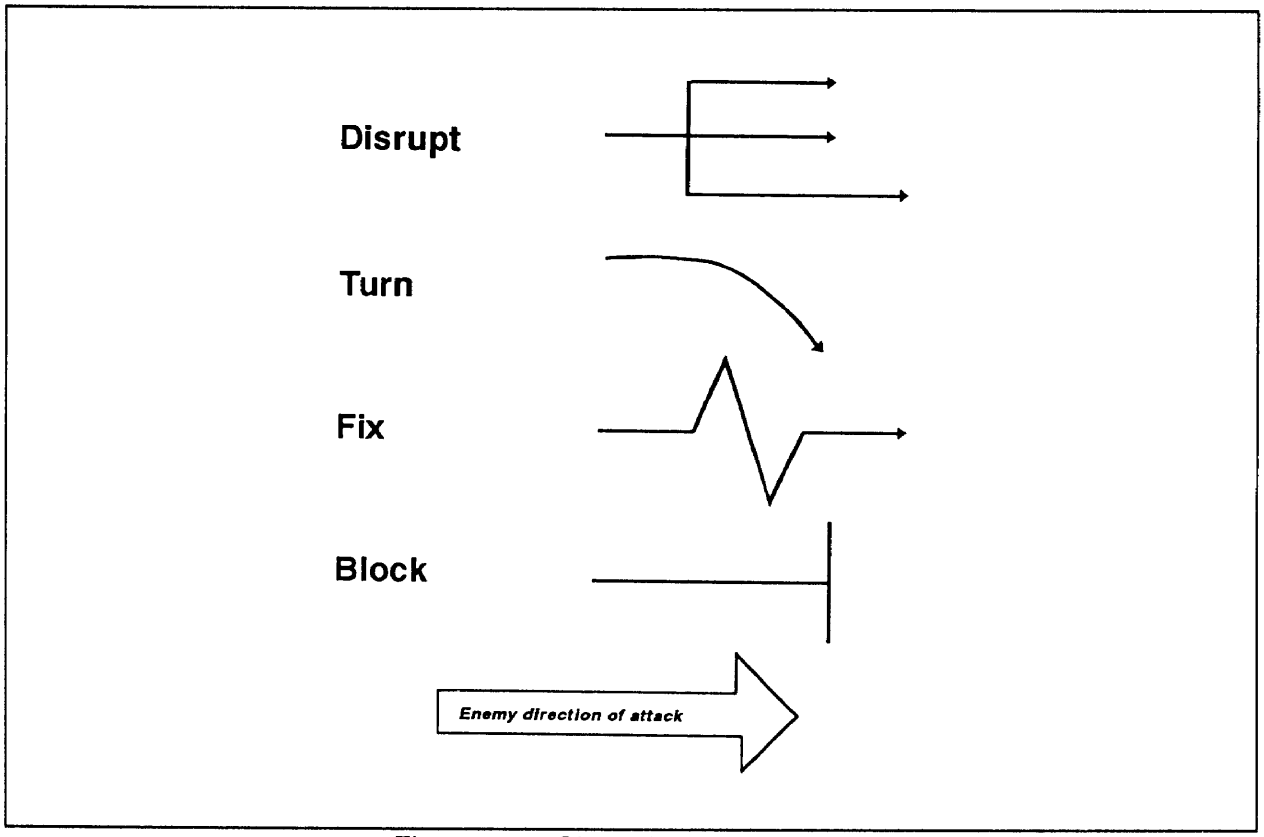


Figure 4-7. Obstacle intent symbols

- The scheme of maneuver, by giving relative location, force allocation with a defined target, and fire planning with maneuver subunit responsibilities.
- The engineer plan, by giving obstacle effects on a defined target and relative location to focus obstacle effort.
- Resource allocation, by giving obstacle effects and relative location, enabling the engineer to use obstacle resource planning factors.

Obstacle Control Measures. In order to effectively plan and focus the division's obstacle effort, the division engineer must understand the total realm of functions and principles for obstacle zones, belts, groups, and individual obstacles. His plan influences the obstacle planning process down to the obstacle-emplacing unit.

Obstacle zones. An obstacle zone is a graphic obstacle control measure used by divisions to designate an area in which subordinate brigades are authorized to emplace tactical obstacles. The division commander uses obstacle zones to control and focus the obstacle effort for subordinate units. The division's scheme of maneuver drives the shape and location of the obstacle zone. Obstacle zones are given to subordinate maneuver brigades and separate maneuver forces (for example, the division CAV squadron) and do not cross their boundaries. Responsibility for obstacles on a boundary is covered under flank coordination. By not crossing the subordinate boundaries, obstacle zones enhance C2, assign specific responsibilities, and facilitate future operations. Obstacle intents are not normally assigned to obstacle zones. The intent will be given only when the division commander deems it a division-essential task

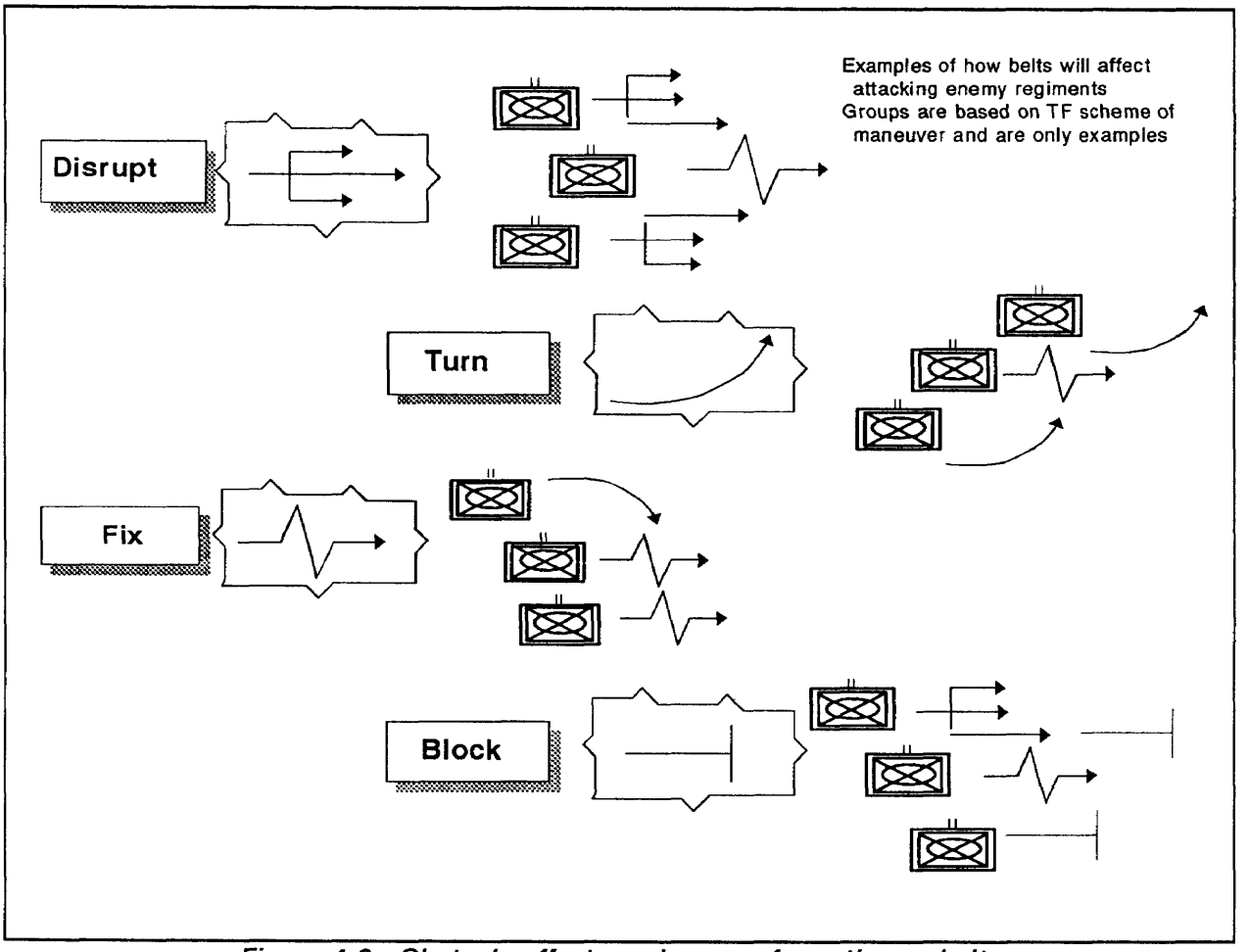


Figure 4-8. Obstacle effects and enemy formations - belts

having a specific effect on an attacking enemy division. Obstacle zones drive the initial flow of obstacle material to the committed forces. Obstacle zone development will be discussed in detail later in this chapter.

Obstacle belts. An obstacle belt is a graphic obstacle control measure used by brigades to designate an area within an approved obstacle zone in which subordinate units are authorized to emplace tactical obstacles. Obstacle belts must be inside obstacle zones or approved by division. Brigade commanders use obstacle belts to focus countermobility effort and fire planning. The obstacle-belt intent specifies to task force commanders what effect the scheme of maneuver and obstacle must have on the enemy's ability to maneuver.

The maneuver brigade commander designates obstacle belts to his subordinate maneuver battalions based on the division's obstacle zones and the brigade's scheme of maneuver. Obstacle belts focus and synchronize the brigade's obstacle effort. They generally straddle the enemy avenue of approach that the maneuver battalions are allocated against. Tactical obstacles are only permitted within the confines of the obstacle-belt graphic.

This is the first echelon of obstacle planning where an obstacle intent must be given for each obstacle belt. A sample obstacle-belt

intent would be, "The intent of obstacle belt A2 is to turn a motorized rifle regiment (MRR) on Avenue of Approach 2 and place the MRR in engagement area (EA) SKULL." The belt graphic and intent facilitate throughput of Class IV/V (obstacle) supplies to the maneuver battalions. The brigade engineer resources obstacle belts based on the belt intent, the standard planning factors, and the sum of the mobility corridors that the belt straddles. This provides an approximation of the linear obstacle effort needed to achieve the belt intent. Obstacle belts do not cross maneuver battalion boundaries for the same reasons that obstacle zones do not cross brigade boundaries.

Obstacle groups. An obstacle group is an array of individual tactical obstacles within an obstacle belt whose combined effect accomplishes a single obstacle intent (turn, block, disrupt, or fix). Obstacle groups must be inside an obstacle belt or approved by brigade. Battalion task force commanders designate obstacle groups to integrate individual obstacle effort and indirect and direct fires. Obstacle groups directly target the threat formation that the maneuver company and teams are allocated against. Groups combine individual obstacles to accomplish a single effect. Obstacle group effects have specific integration techniques with the direct-and indirect-fire organization of the EA.

The task force commander allocates groups (based on the obstacle-belt intent) and graphics along with the task force scheme of maneuver. The summation of the obstacle groups that the battalion directs must accomplish the obstacle-belt intent. In other words, if the battalion is given the responsibility for a turning obstacle belt, the task force commander is not limited to turning groups only. For example, the battalion commander could target a first-echelon enemy battalion with a disrupting obstacle group, followed by a blocking obstacle group that denies a specific mobility corridor, and ending with a turning obstacle group against other enemy battalions. The total effects of the obstacle groups are turning an attacking enemy regiment. See Figure 4-8, page 4-11, for examples.

Individual obstacles. There are four general categories of individual tactical obstacles. The individual obstacles are those in obstacle groups, directed obstacles, reserve obstacles, and situational obstacles.

Individual obstacles in obstacle groups. Individual obstacles are tailored to the obstacle group effect and the threat. For example, minefield densities, composition, pattern, depth, and frontage have specific norms for achieving the disrupt, turn, fix, and block obstacle effect. These norms facilitate platoon drills and obstacle resourcing. Refer to FM 20-32 for more information. When employed, tank ditches are used to complement turning and blocking obstacle groups. Leaders ensure individual obstacle siting is consistent with the obstacle group's in tent and overmatching weapons systems.

If the mobility corridor is restricted, then point obstacles can also achieve a specific effect. One point obstacle in a platoon or smaller mobility corridor could achieve a disrupt effect, while several point obstacles in depth along the same mobility corridor can achieve a fix effect. This is extremely useful in restrictive terrain and for armored ambushes. Predominantly, light forces use this technique in restrictive terrain against an armored threat. However, to achieve a block or turn, individual obstacle norms must be used.

Directed and reserve obstacles. A directed obstacle is an obstacle directed by a higher commander as a specified task to a subordinate unit. A reserve obstacle is an obstacle for which the commander restricts the execution authority. The commander usually specifies the unit responsible for obstacle emplacement, handover, and execution. The commander must clearly identify the conditions under which the obstacle is to be executed. Only the division com-

mander can authorize directed or reserve obstacles outside of an obstacle zone. In turn, only the brigade commander can authorize directed or reserve obstacles outside of an obstacle belt. Brigade directed and reserve obstacles must be within an obstacle zone. The maneuver battalion commander can authorize obstacles anywhere in his directed obstacle belt. This control procedure ensures control of the entire tactical obstacle effort.

Situational obstacles. A situational obstacle is a tactical, obstacle-emplacement capability held in reserve. Execution is triggered by friendly actions, enemy actions, or a combination of the two. Reserve obstacles and situational obstacles are different. A situational obstacle can be shifted to different locations, whereas a reserve obstacle is located at a specific key location. A situational obstacle must be within the executing maneuver unit's obstacle control measure.

Situational obstacles contain the three components of obstacle intent (obstacle effect, a target, and relative location) and require integration into the decision support template to be executed effectively. The plan must identify the trigger action and execution criteria at a specific decision point and the necessary subunit instructions to emplace and cover the obstacle. The division engineer has three possibilities for employing situational obstacles. The first is to plan and execute the obstacle at division level. The second is to identify the obstacle intent and allocate the resources to a subordinate unit to execute. The third is to allocate the resources for a subordinate unit to plan and execute.

Guidelines for Planning Obstacle Control Measures. Planning guidelines can be established between obstacle control measures and the size of the enemy avenue of approach (Figure 4-9, page 4-14). In general, the commander assigns an obstacle control measure on the same size enemy avenue of approach he uses as a basis for arraying subordinate forces. For example, an armored or light division assigns obstacle zones to its brigades which are arrayed on division avenues of approach. However, a light division defending against a mechanized division arrays its brigades to defeat enemy mechanized regiments and brigades. The light division would designate obstacle zones on the mechanized regiment or brigade avenues of approach. As shown in Figure 4-9, the same logic applies to every echelon and obstacle control measures. The commander may use different guidelines based on the estimate of the situation, enemy, time, terrain, and troops available.

Obstacle Control Principles

Planning obstacle zones is an art. However, certain norms and principles and the planning process provide the structure to tailor obstacle zones to support the division commander's intent and scheme of maneuver. Understanding division and brigade doctrine provides the foundation for defensive norms and principles. Examples that the division engineer uses to provide this foundation are shown as follows:

- FM 100-5, Chapters 8 & 9.
- FM 5-100, Chapter 7.
- FM 71-100, Chapter 5.
- FM 71-3, Chapter 4.
- FM 7-30, Chapter 4.
- Echelons of obstacle planning and obstacle intent.
- Engineer estimate.

Understanding brigade operations is critical for the division engineer in order to anticipate the needs of the maneuver brigade commander.

In general, obstacle zone planning is guided by three obstacle control principles for supporting division defense operations. These principles help shape the engineer countermobility effort for the division:

Obstacle Control Measure	Size of Enemy Avenue of Approach	
	Armored Force & LT vs LT	LT vs Enemy Mech Force
Zone	Division	Regiment/Bde
Belt	Regiment/Bde	Battalion
Group	Battalion	Company
Obstacle	Company	Platoon

NOTE: Norms are for the main battle area

Figure 4-9. Obstacle control measures planning norms

1. Supports the division's scheme of maneuver and the commander's intent.

2. Balances maximum flexibility versus focusing obstacle effort.

3. Facilitates future operations.

Supports the Division's Scheme of Maneuver and the Commander's Intent. The division engineer must understand the division's defeat mechanism, the division commander's vision of the operation, the division's main effort and when it changes, and the division's synchronization requirements across the battlefield framework (close, deep, and rear). These are the elements which ensure that obstacle zones support the division's scheme of maneuver and the commander's intent.

The defeat mechanism guides the division engineer in determining general areas that require obstacle effort and areas that must be free of obstacles or have restrictions (such as the division counterattack force's axis and objective). The defeat mechanism also drives the type and amount of engineer support to the subordinate units. The division commander's vision of the operation describes how the division will achieve the desired end state relative to friendly forces, the terrain, and enemy forces. This vision, along with the defeat mechanism, provides a general framework that brings together the elements of obstacle intent, target, effect, and relative location. The division engineer uses this framework to generally envision how subordinate maneuver commanders will fight. This is critical in anticipating the needs and pushing resources to the maneuver brigades.

The division's main effort and when it changes gives the division engineer a guide in determining obstacle zone priorities and weighting the main effort with engineer resources (manpower and materials). Certain synchronization requirements impact obstacle-zone planning across the defensive framework. The division engineer considers division control and synchronization measures as he develops the obstacle zone design (see the next principle).

Balances Maximum Flexibility Versus Focusing Obstacle Effort. Desining obstacle zones is a balancing act between providing maximum flexibility and focusing tactical obstacle employment for the sub ordinate maneuver commander. Maneuver brigades are normally given sectors to defeat the attacking enemy but may be given a battle position or strongpoint. The battle position and strongpoint are more restrictive control measures. Defending in sectors gives the brigade commanders the freedom to maneuver and also decentralizes fire planning; whereas, the battle position dictates where the majority of the brigade's combat power will be positioned. Even with a more restrictive control measure as the battle position, brigades still require flexibility in tactical obstacle employment. The strongpoint is the most restrictive, and obstacle zone flexibility is greatly reduced and focused.

The division engineer provides the required flexibility with obstacle zone graphics through two dimensions: width and depth. The obstacle zone permits the brigade commander to employ tactical obstacles to complement his decentralized fire planning and his allocation of maneuver battalions, whether in sector or battle position. The maneuver brigade is assigned a sector or battle position based on the attacking enemy's combat power along a specific avenue of approach. At bare minimum, the width of the obstacle zone encompasses the avenues of approach. The maximum flexibility for an obstacle zone width is the entire subordinate's sector. The commander must understand that a zone covering an entire sector may restrict his ability to seize the initiative with a counterattack. Ideally, this risk should be considered during war gaming. Two exceptions for not providing this flexibility are facilitating future operations (discussed in the next principle) and obvious no-go terrain (against an enemy armored force), which prevents the enemy's ability to maneuver.

The depth of the obstacle zone is tailored to the division's scheme of maneuver and the commander's intent. Specific phase lines normally aid in tailoring the depth of the obstacle zone. For example, one brigade might be given the mission to defend well forward in the sector. The obstacle zone would facilitate this intent by allowing less depth. Typical graphics that aid in focusing the depth of an obstacle zone are on-order boundary changes, battle handover lines (BHLs), rear boundaries, forward edges of the battle area (FEBAs), lines of departure (LDs), lines of contact (LCs), fire-control lines (fire-support coordination lines (FSCLs), no-fire areas (NFAs), coordinated fire lines (CFLs)), passage lanes and corridors, and phase lines controlling friendly force positioning.

Facilitates Future Operations. To facilitate future operations, the division engineer uses obstacle zones as a restriction of tactical obstacle employment. Directed and reserve obstacles are the only exceptions for obstacles outside an obstacle control measure. The division's need for future mobility drives the need to restrict tactical obstacles. The division's counterattack force's axis and objective are standard examples for the division's future mobility needs. Another example is for the division to reposition forward as a subcomponent of the corps plan. The restrictions fall into two categories: decreasing flexibility and obstacle restrictions. Decreasing flexibility involves reducing the depth and width of individual obstacle zones. Shaping obstacle zones so that they do not overlap the counterattack axis and objective ensures the

freedom of the counterattack force. Obstacle restrictions place limits on the method, type, and location of obstacles authorized to be emplaced within an obstacle zone or belt. Typical examples are allowing surface-laid mines only, restricting the use of antihandling devices, and specifying a no-later-than self-destruct time for scatterable mines. These obstacle restrictions facilitate future occupation and clearing of the obstacles by friendly forces.

Obstacle Planning Process

The echelons of obstacle planning and obstacle control principles provide the foundation for the obstacle planning process. At division level, the staff and engineer plan zones to control and focus obstacle effort for subordinate units. There are two techniques for developing obstacle zones and resourcing the zones with obstacle capability. One technique is to develop tentative belts, group the belts into zones, and resource the zones with obstacle capability based on the tentative belts. That is the technique used for these scenarios.

Another technique develops zones and task organization based on the scheme of maneuver and resources the zones with obstacle capability based on the division main effort, priorities, and task organization. This technique is normally used when time is a critical factor in the planning process. This technique involves some risk. Zones are developed based on division-level graphics.

Like the engineer estimate, obstacle planning steps are conducted concurrently as the scheme of maneuver is developed.

Situation Analysis. The goal of situation analysis is twofold for the division engineer. They must know the templates (doctrinal, situation, and event) that the division staff develops and the EBA. The key questions the division engineer concentrates on are–

- How will the enemy allocate his combat power?
- Where will the enemy array (two levels down) his forces and his formation norms?
- When will the enemy attack?
- How will the enemy weight his main effort?
- What are the enemy's objectives and tactical options or alternatives?
- How will the enemy use his engineer and mobility assets? (Focusing on mobility for his forward forces and countermobility for his flanks.)

The answers to these questions provide the division engineer the foundation for understanding and participating in the development of scheme of maneuver and engineer operations. This specifically shows how, where, and when the enemy will attack and where he is going (his objectives). The event template could also identify vulnerabilities or windows of opportunity which effect tactical obstacle employment.

Organization of the Operation. The division staff and G3 develop courses of action using the steps outlined below:

1. Analyze relative force ratios.
2. Array initial forces.
3. Develop scheme of maneuver.
4. Determine C2 means and maneuver control measures.
5. Prepare course of action statements and sketches.

The division engineer must know how the G3 develops the course of action. With the information gained from the situation analysis, the G3's array of friendly forces is based on the situation template and relative

force ratios. For example, a ratio of 1:3 and 1:16 are the norms for a prepared defense and delay. The G3 takes his array of forces and develops a scheme of maneuver and determines C2 measures and requirements. The engineer sketches tentative obstacle belts to support the array of forces and the scheme of maneuver. This provides the initial start in tailoring obstacle zones to support the scheme of maneuver for that particular course of action.

The array of friendly forces, scheme of maneuver, and C2 measures and requirements aid the division engineer in envisioning the subordinate maneuver commanders' fight. Basically, the division engineer considers the two obstacle-zone dimensions. The obstacle zones for the division must complement the defeat mechanism. General guidelines can be used in relation to the defensive patterns, as mentioned earlier. The division engineer uses the array and allocation of friendly forces on specific avenues of approach and maneuver control measures to sketch proposed obstacle zone boundaries.

Mobility and Future Operations Requirements. The division engineer alters the proposed obstacle zones based on the division's mobility requirements and future operations. The second and third obstacle control principles (supports the division's scheme of maneuver and the commander's intent and facilitates future operations) are directly applicable for this step. The division engineer identifies areas which must be free of tactical obstacles and where obstacle restrictions are required to facilitate future operations. These areas cause the proposed obstacle zone's boundaries to be adjusted and specific restrictions (if applicable) assigned to certain zones. Other mobility operations, such as a passage of lines on lanes, may require division reserve obstacles. The obstacle zones are finalized and tied to maneuver graphics and terrain.

0bstacle Resourcing. There are two basic ways to resource obstacle zones. One technique is to allocate resources based on task organization. For example, if the division has 15 engineer companies, the resource allocation for each company is 1/15 of the resources available after the main effort has received their initial resource allocation.

Another technique is to resource the obstacle zones based on the division commander's intent; scheme of maneuver; and subordinate maneuver units' subunit instructions, which have been captured with tentative obstacle belts. The division engineer patterns obstacle intents based on assumptions of how the subordinate maneuver commander will fight. Complete understanding of the situation analysis step facilitates this process. The width of the avenue of approach that the assumed obstacle belt straddles is multiplied by the obstacle intent resource factor (indicated below).

Obstacle effect	Resource planning factor
Disrupt	0.5
Turn	1.2
Fix	1.0
Block	2.4

This provides the amount of linear obstacle effort required in the obstacle belt. The division engineer can sum the total linear effort required for all the planning belts and translate this sum into manpower, material, and time required using standard planning factors and obstacle packages.

The division engineer must also anticipate the subordinate maneuver brigades' survivability requirements. The EBA analysis of friendly capabilities of organic and corps engineer forces provides an approximation of the survivability capabilities within the division engineer battalions supporting the maneuver brigades (HHC for division light engineer battalions). The subordinate

brigades' missions drive the allocation. As a norm, a brigade conducting an area defense requires a more intense blade effort than a mobile defense. Based on standard survivability planning factors, the division engineer can task organize corps engineer assets based on the anticipated needs of the committed brigades.

At the end of this step, the division engineer overlays the necessary engineer C2 requirements over their allocation of resources. This is inputted into the division's task organization. The obstacle-zone graphics, obstacle restrictions, responsibilities, and special considerations are finalized.

Scheme-of-Obstacle Overlay. The scheme-of-obstacle overlay is normally an appendix to the engineer annex at division level. The scheme-of-obstacle overlay contains the following elements:

- Engineer task organization.
- Obstacle-zone graphic.
- Obstacle-zone table depicting responsibility and priority.
- Obstacle intent (three components), if applicable.
- Passage lanes that require reserve obstacles, if applicable.
- Obstacle restrictions by obstacle zone, if applicable.

This overlay provides the subordinate maneuver commanders and their engineer staff the necessary tools to initiate the planning process.

ENGINEER SUPPORT TO AN ARMORED DEFENSE

In the defense, armored divisions seek to maximize their firepower, mobility, and shock effect. They may defend by initially delaying the enemy to determine his intentions and then by launching strong counterattacks against his flanks and rear in prepared areas. FM 71-100 further describes how armored divisions conduct defensive operations. Engineer planning focuses on each area of the defensive framework–deep, security, MBA, reserve, and rear operations. The division engineer uses the engineer estimate to identify engineer missions; synchronize mobility, countermobility, and survivability; and allocate resources. The obstacle planning process previously discussed is the tool for integrating obstacles into the division scheme of maneuver.

The following is a division scenario illustrating the integration of engineer operations into the division defensive framework.

Division Scenario

The division's mission is to conduct a defensive operation to defeat an attacking corps consisting of three mechanized divisions forward of phase line (PL) LAKE. The graphic portrayal of the division's scheme of maneuver and engineer organizations available are depicted in Figure 4-10. Corps will conduct deep operations forward of PL SEA, targeting the enemy's advance guard.

The division's scheme of maneuver is a four-phase operation:

Phase 1 - Preparation/counterreconnaissance.

Phase 2 - Defense forward of PL STREAM.

Phase 3 - Counterattack.

The following is a list of the key subunit instructions:

1st Brigade

1. Defeat first-echelon division forward of PL STREAM.
2. Delay back to PL LAKE, creating a perceived salient for Phase 3.

2nd Brigade

Defend forward of PL STREAM, allowing no penetration larger than platoon (+) size.

3rd Brigade

Counterattack (Phase 3) into objective (OBJ) VIPER to defeat the second-echelon division.

Aviation Brigade

Counterattack (Phase 3) into OBJ COBRA, targeting C2 and CSS elements of the second-echelon division and corps.

Cavalry Squadron

1. Screen between PL RIVER and PL OCEAN.
2. Conduct battle handover with 1st and 2nd brigades.

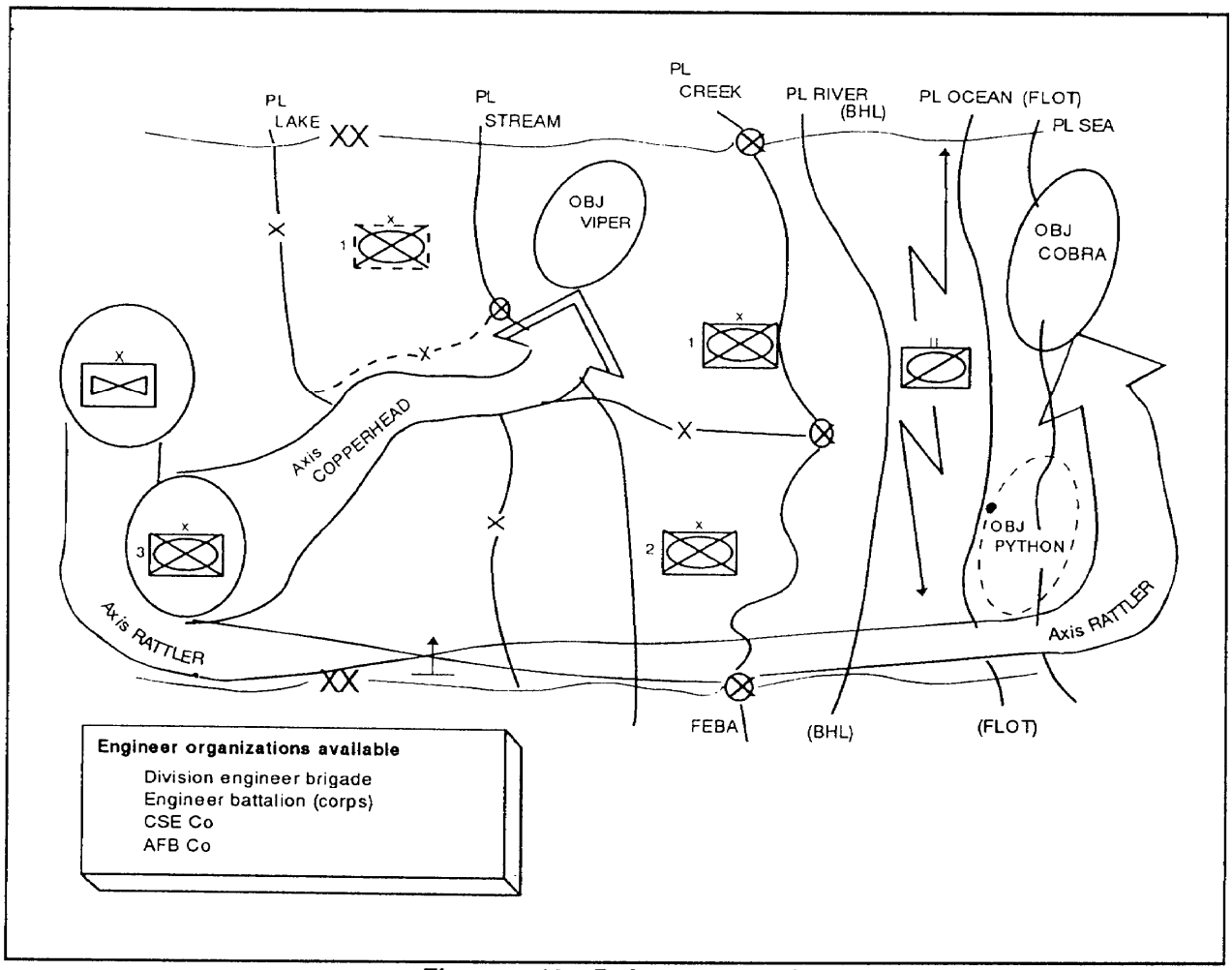


Figure 4-10. Defense scenario

Deep Operations

The division engineer, as noted in Chapter 1, focuses on supplementing the IPB, HVT nominations, and the use of situational obstacles. The corps' covering-force operation could limit the division's deep operation for targeting HVTs and situational obstacles. However, during the division's counterattack (Phase 3), the employment of situational obstacles (area denial artillery munitions (ADAMs)/remote antiarmor mine system (RAAMS) (limited range) or Gator) helps to isolate regiments in the second-echelon division. Coordination between the division and corps is required. If authorized, the division engineer establishes an obstacle zone to support this employment of situational obstacles. Since the brigades have limited capability in "seeing deep", this coordination must be planned and executed at division level. The division engineer, along with the G2, G3, and other staff officers, as required, identify the obstacle intent, locations, and timing in relation to the execution criteria and decision points.

Security Operations

The CAV squadron is the division's covering force. Their mission is to screen between PL RIVER and PL OCEAN. The division engineer must understand the impact of the screen mission versus a guard or cover security mission. A screen provides early warning; whereas, a covering force that is given a guard or cover mission protects the MBA force and conducts screens, attacks, defends, and delays, as required. The obstacle effort required increases from the screen or guard missions to the cover mission. See Figure 4-11 for a sketch of the CAV squadron.

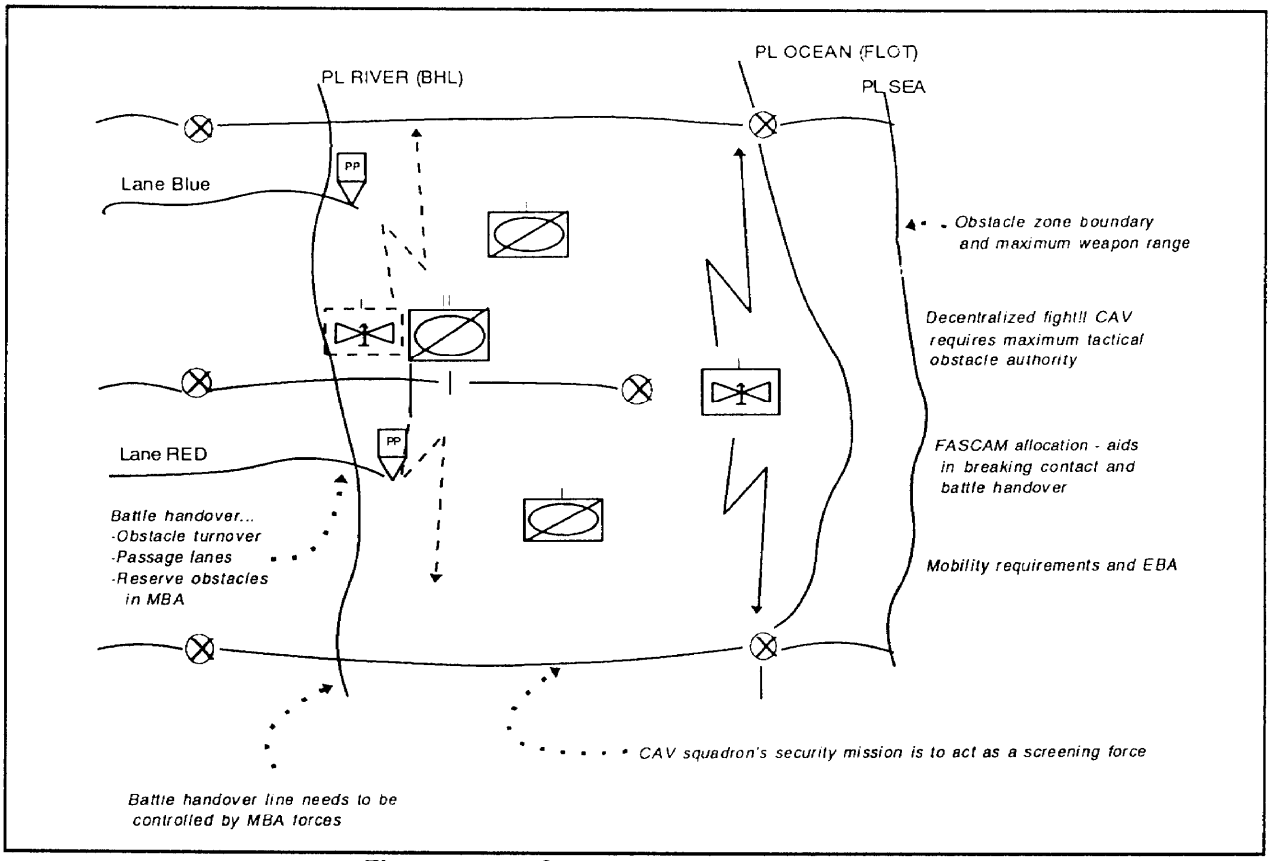


Figure 4-11. Security operations analysis

The screen is a very decentralized fight. The division engineer anticipates that the CAV could employ three disrupting obstacle belts. These tentative belts were grouped into obstacle zone ALPHA. This means the obstacle zone must facilitate maximum flexibility to employ tactical obstacles. PLs RIVER (BHL) and SEA (division forward boundary) impact on the obstacle zone's design. The obstacle zone's forward limit can be directly tied to PL SEA. PL RIVER is the BHL. The BHL needs to be controlled by the MBA forces in order to have a successful acceptance of the fight. The division engineer adjusts the rear boundary of the obstacle zone forward of PL RIVER, allowing MBA forces to employ tactical obstacles to support the battle handover. See Figure 4-12 for an illustration of obstacle zone ALPHA. The division engineer considers scatterable mines to aid the CAV's disengagement. The CAV can be reinforced with modular pack mine systems (MOPMs), air or ground Volcano, and ADAMs' and RAAMS's allocations (requires coordination with the FSCOORD).

Mobility and hasty survivability are critical to the CAV. The EBA analysis reveals the CAV's need for assault bridging. Marking lanes through obstacles and identifying fords and combat trails for egress routes are other mobility tasks in support of the CAV. The CAV requires numerous hull-defilade positions in depth versus fully developed and concentrated turret-defilade positions. As Figure 4-12 indicates, an engineer company is attached to the CAV squadron.

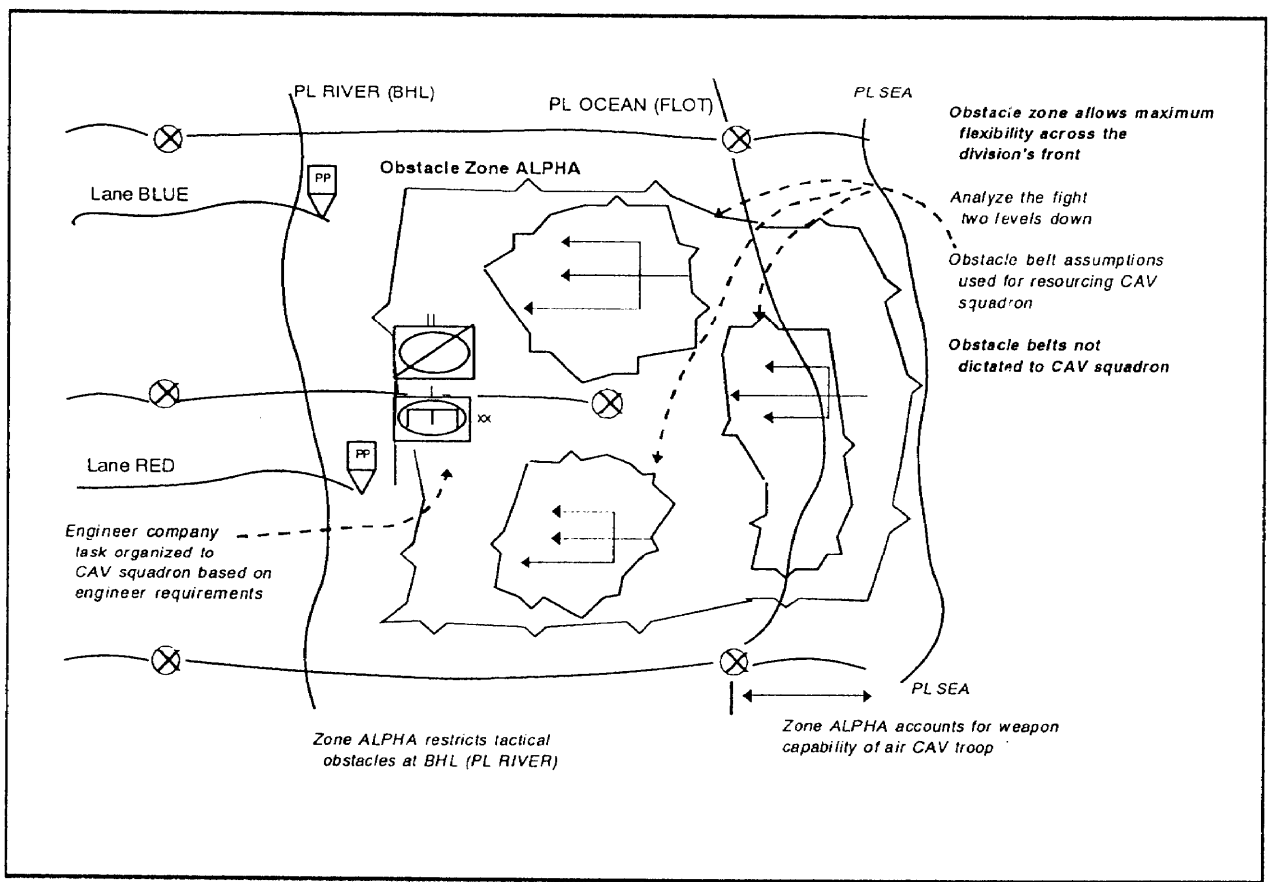


Figure 4-12. Security operations and engineer functions

MBA and Reserve Operations

The division defeats the enemy corps in the MBA. Therefore, the priority for the division engineer's planning is supporting MBA operations. The division engineer includes support to the division's reserve when considering MBA requirements. In this division scenario, the brigade missions and engineer considerations are different. Refer to Figure 4-13 for MBA operations analysis.

1st Brigade. 1st brigade has two fights–forward of PL STREAM and forward of PL LAKE. The division engineer considers the mobility and countermobility requirements for the brigade's mission forward of PL STREAM and its mission to delay back to PL LAKE. Based on these considerations and in order to keep the division's counterattack axis free of obstacles, the division engineer plans two obstacle zones for 1st brigade (Figure 4-14).

The obstacle zone for the brigade's mission forward of PL STREAM must encompass the BHL (PL RIVER). The brigade sector has two regimental avenues of approach. The division engineer anticipates that 1st brigade could employ one blocking and two fixing obstacle belts. These tentative belts were grouped into obstacle zone BRAVO. To give the brigade commander maximum flexibility, the width of this obstacle zone must cover the two regimental avenues of approach. To facilitate the division's

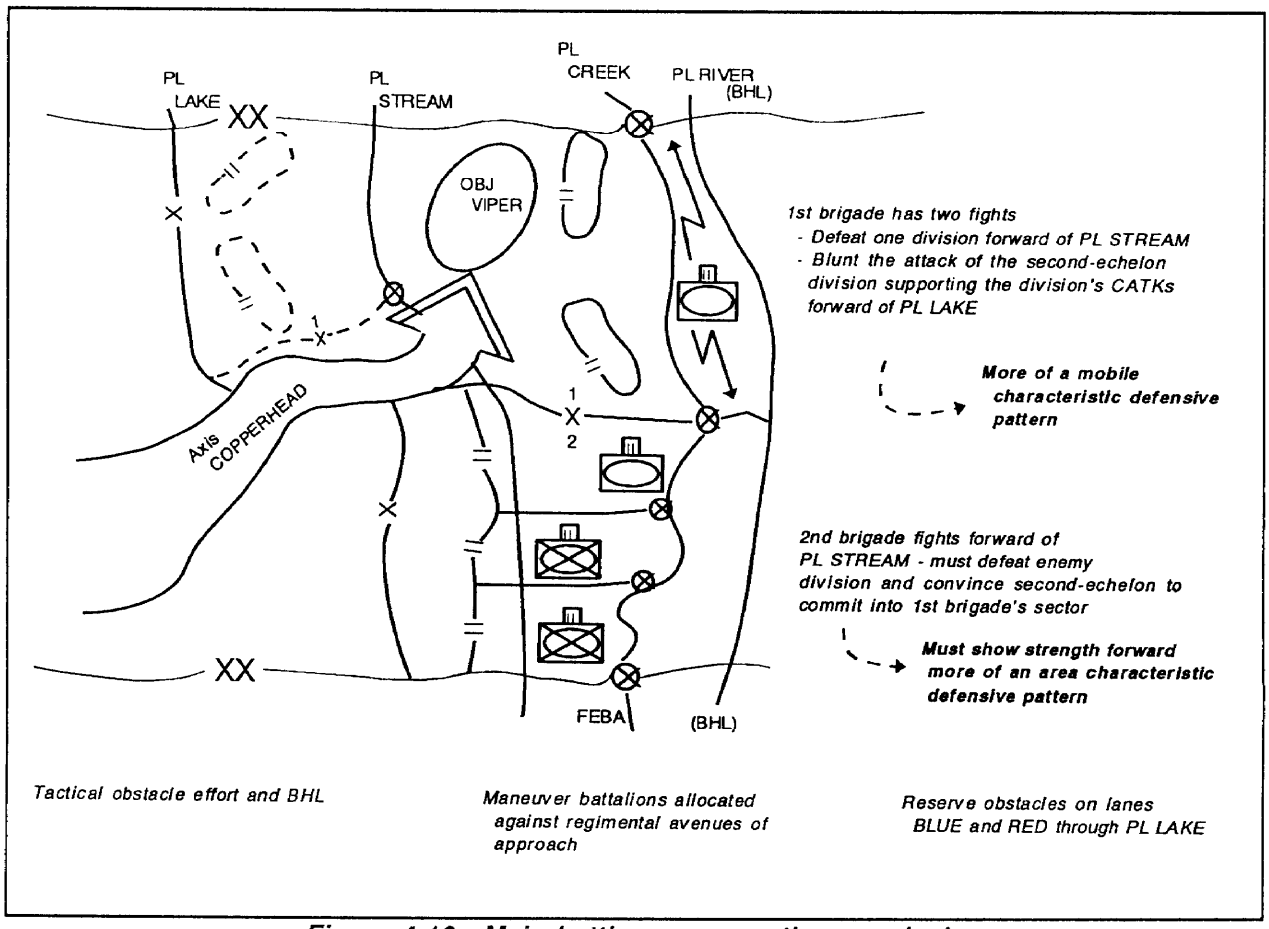


Figure 4-13. Main battle area operations analysis

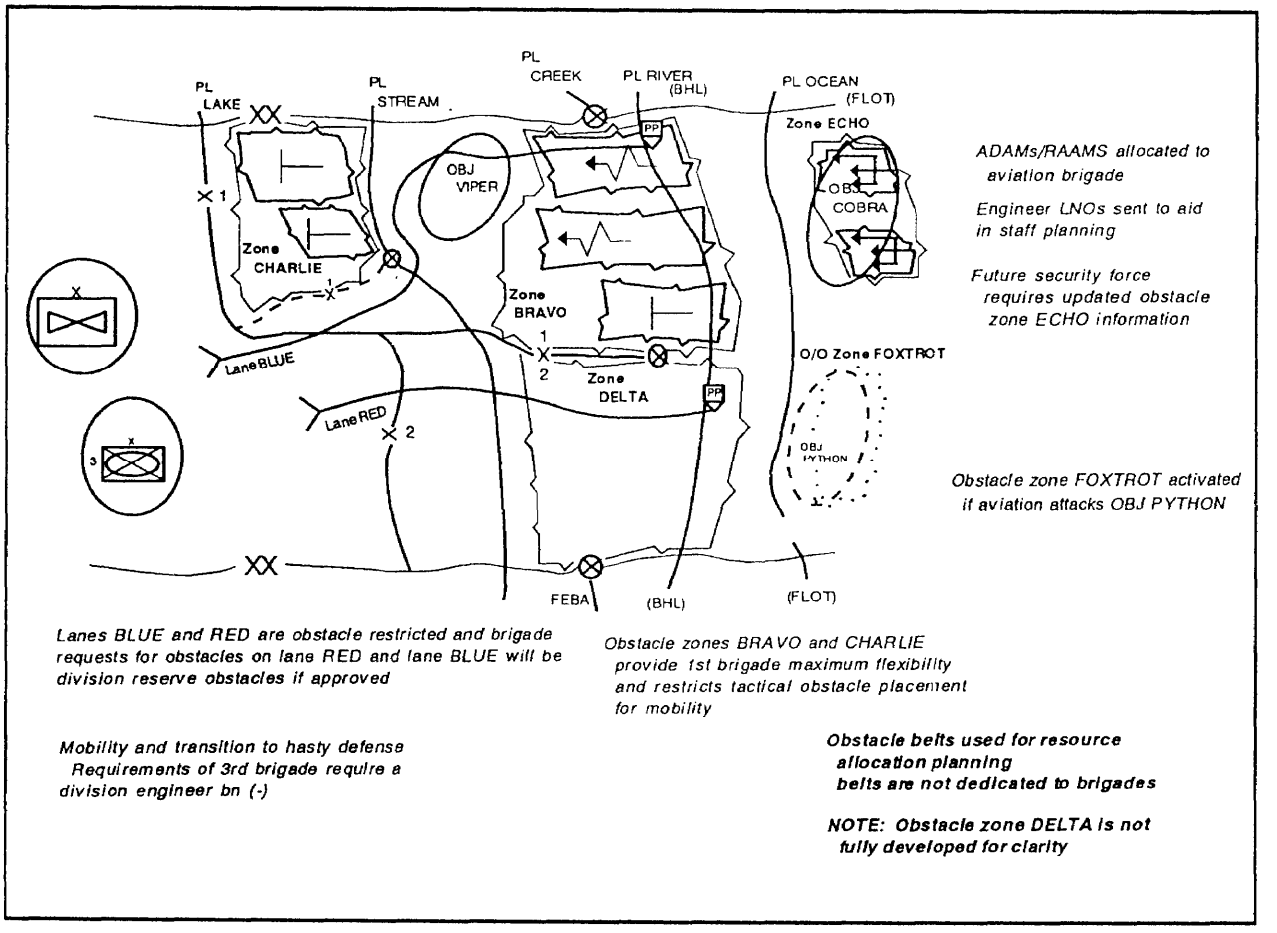


Figure 4-14. Main battle area operations and engineer functions

counterattack, the division engineer restricts the depth of the obstacle zone. These requirements dictate the shape of obstacle zone BRAVO. The division engineer anticipates that 1st brigade will require resources for two fixing belts in obstacle zone BRAVO.

The division engineer must recognize the brigade's need for tactical obstacles for their defense forward of PL LAKE. The division engineer anticipates that 1st brigade could employ two blocking obstacle belts. These tentative belts are grouped into obstacle zone CHARLIE to support this 1st brigade mission. The division engineer allocates resources for two blocking belts.

The division engineer plans for passage of the CAV. He recommends to the G3 that lane BLUE be restricted from any obstacle emplacement. Any request to emplace an obstacle on the route during the preparation and counterreconnaissance phases must be forwarded to division for consideration as a division reserve obstacle.

2nd Brigade. The division engineer uses the same approach taken with 1st brigade. The shape of obstacle zone DELTA follows the same logic of zone BRAVO. However, in order to support the commander's intent and show a strong defense forward, the rear boundary is pushed forward of PL STREAM. This should cause a concentration of

countermobility effort along the FEBA to PL RIVER. Lane RED would have the same obstacle restriction as lane BLUE.

3rd Brigade. The initial focus is the mobility of the division's counterattack force. See Figure 4-15 for counterattack analysis. The obstacle zones shapes facilitate the future operation. The situational analysis and EBA aid in identifying 3rd brigade's mobility needs. Specifically, the division engineer's analysis of the enemy's scatterable mine and flank obstacle-employment capability will determine if 3rd brigade needs to breach enemy minefield. At the end of the attack, 3rd brigade conducts a hasty defense orienting in obstacle zone BRAVO. Close coordination between 1st and 3rd brigades is required. Specific coordination instructions will be identified for both brigade staffs and supporting engineer battalions.

Aviation Brigade. The aviation brigade is conducting a supporting attack into the second-echelon division's rear (OBJ COBRA). Tactical obstacles would aid the attack helicopters in their fight. The division engineer tailors obstacle zone ECHO to support only the fight in OBJ COBRA. The allocation of scatterable mines and the priority of employment will shift to the aviation brigade during the counterattack phase. The division engineer contemplates which scatterable assets to allocate to the aviation brigade. Ground-emplaced assets

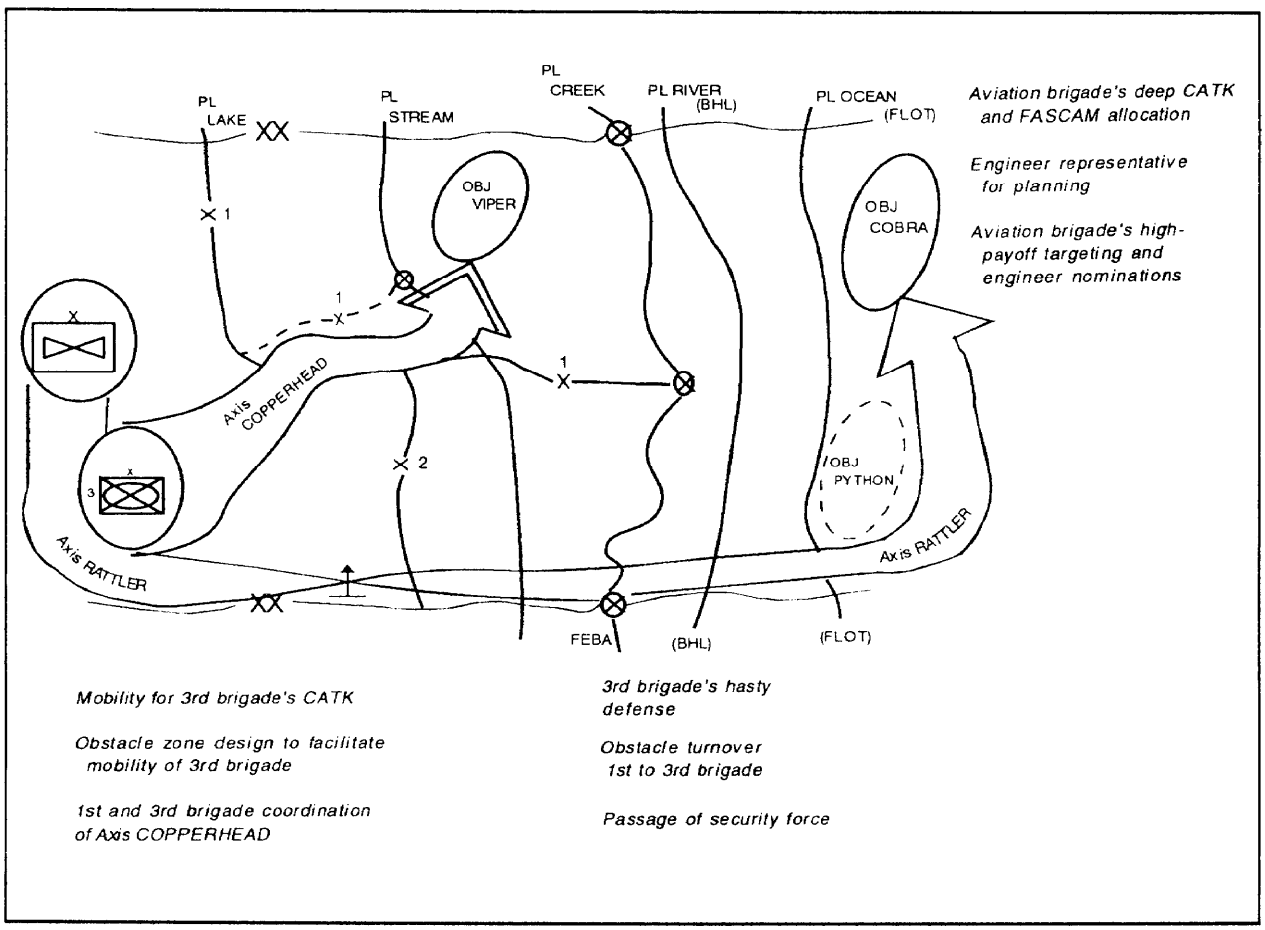


Figure 4-15. Main battle area counterattacks analysis

are ruled out immediately due to the lack of ground security. Air Volcano is an option. The division staff must consider the status of SEAD missions and the ability of the enemy to engage the Blackhawk delivering the mines. This rules out the air Volcano as the choice asset. Gator could be used if allocated, and SEAD/Joint SEAD (JSEAD) missions target local threats. ADAMs and RAAMS are available. ADAMs and RAAMS's allocations are coordinated with the FSCOORD to support the aviation brigade. Due to this allocation, an engineer staff planner must be sent to the aviation brigade to assist in ADAMs and RAAMS employment planning.

Rear Operations

Rear operations outlined in Chapter 1 are applicable. The DIVEN headquarters relies heavily on corps support. They concentrate on the division's needs to sustain the force. The DIVEN headquarters assigns missions to the CSE company to maintain the LOCs and to construct facilities for the main support battalion and corps support command (COSCOM) units in the division rear area. See Figure 4-16 for a sketch of the rear area. The routes for the division's counterattack force through the division rear area must be created or maintained (Figure 4-17, page 4-26).

The DIVEN headquarters must plan to maintain the mobility along the LOCs from the

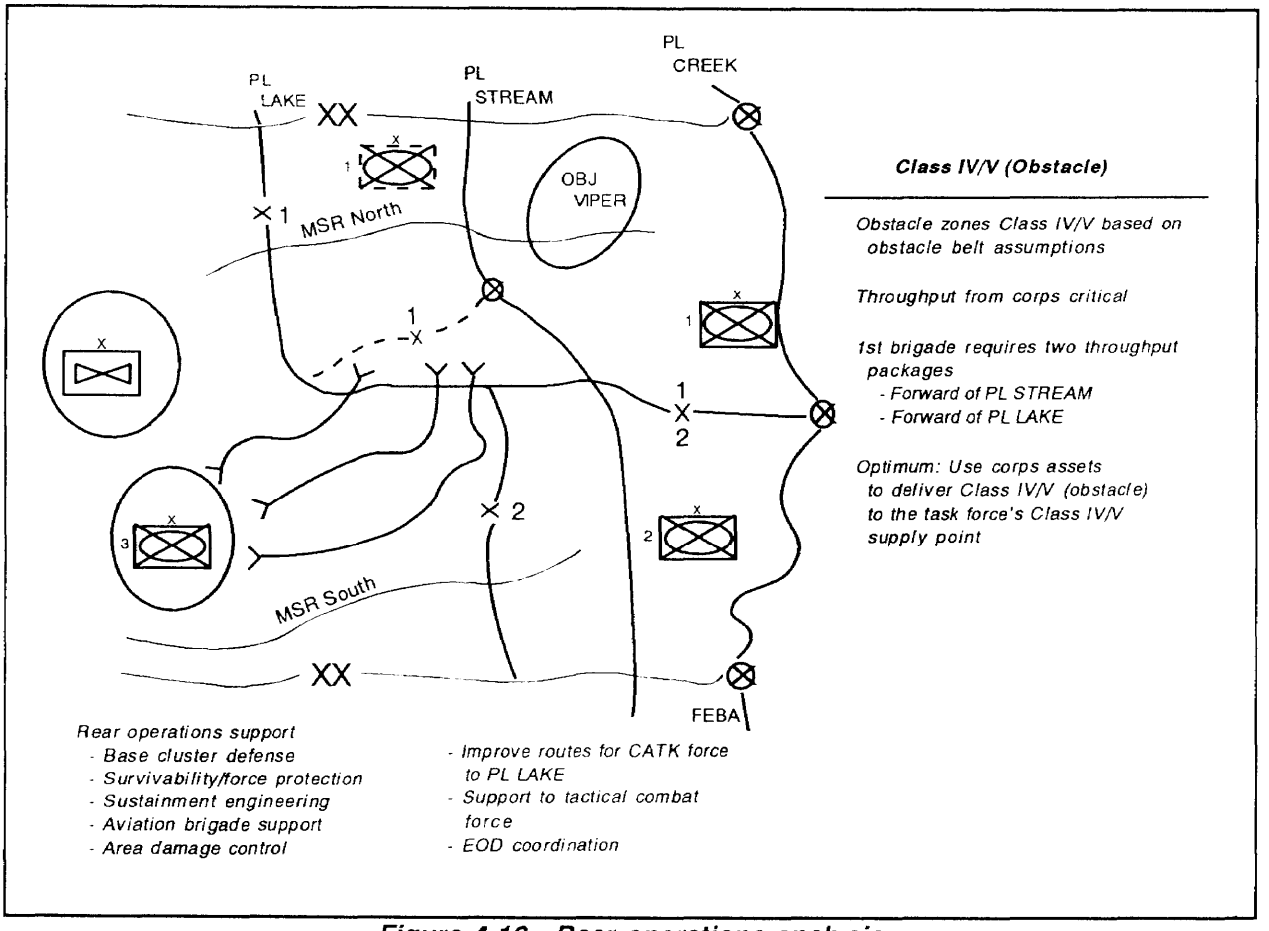


Figure 4-16. Rear operations analysis

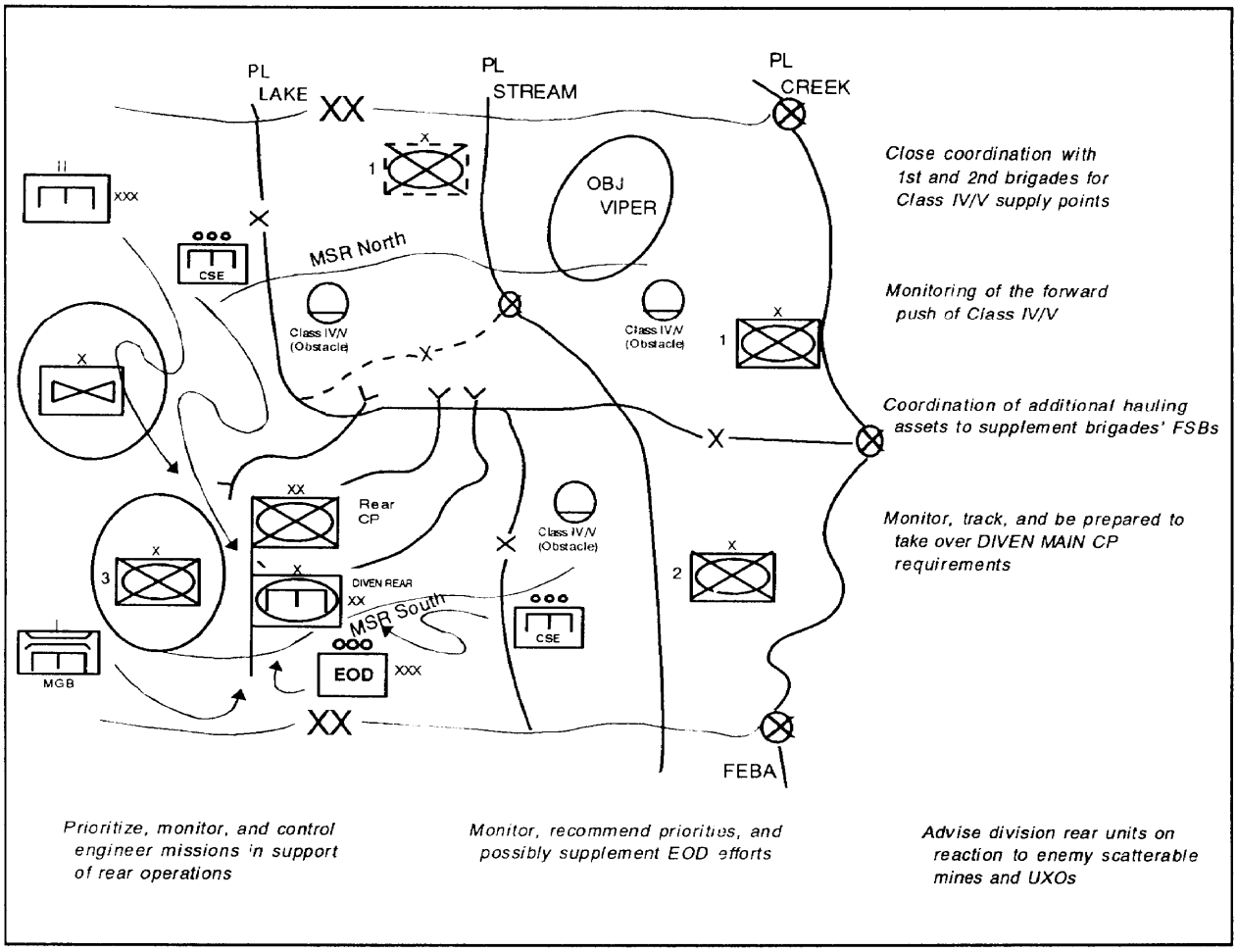


Figure 4-17. Rear operations and engineer functions

DSA to the brigade support areas (BSAs). They must anticipate contingencies to react to the enemy's use of scatterable mines. The corps engineer battalion is assigned this contingency. Unexploded ordinance (UXO) is an explosive ordnance disposal (EOD) mission. Requests for EOD support go to the division REAR CP for action. If EOD support is not available or the saturation of UXOs is too great for the EOD unit, engineers could assist in this mission. The DIVEN REAR CP keeps tabs on EOD missions if the UXO area effects the division's mission.

The survivability of sustainment operations in the rear area is essential to maintaining combat operations. Engineer survivability is supported through fortifications and protective obstacles. The DIVEN headquarters, along with the REAR CP, plan for survivability of all units in the rear area. The support is tailored to the base cluster defense plan. See Figure 4-18 for an example. The DIVEN headquarters recommends to the REAR CP the priorities of support. The priorities are based on four factors:

1. Vulnerability of the base cluster.

2. Ability of the units in the base cluster to defend themselves.

3. Criticality of the unit to the success of the division mission.

4. Recuperability of the unit and its assets in the base cluster.

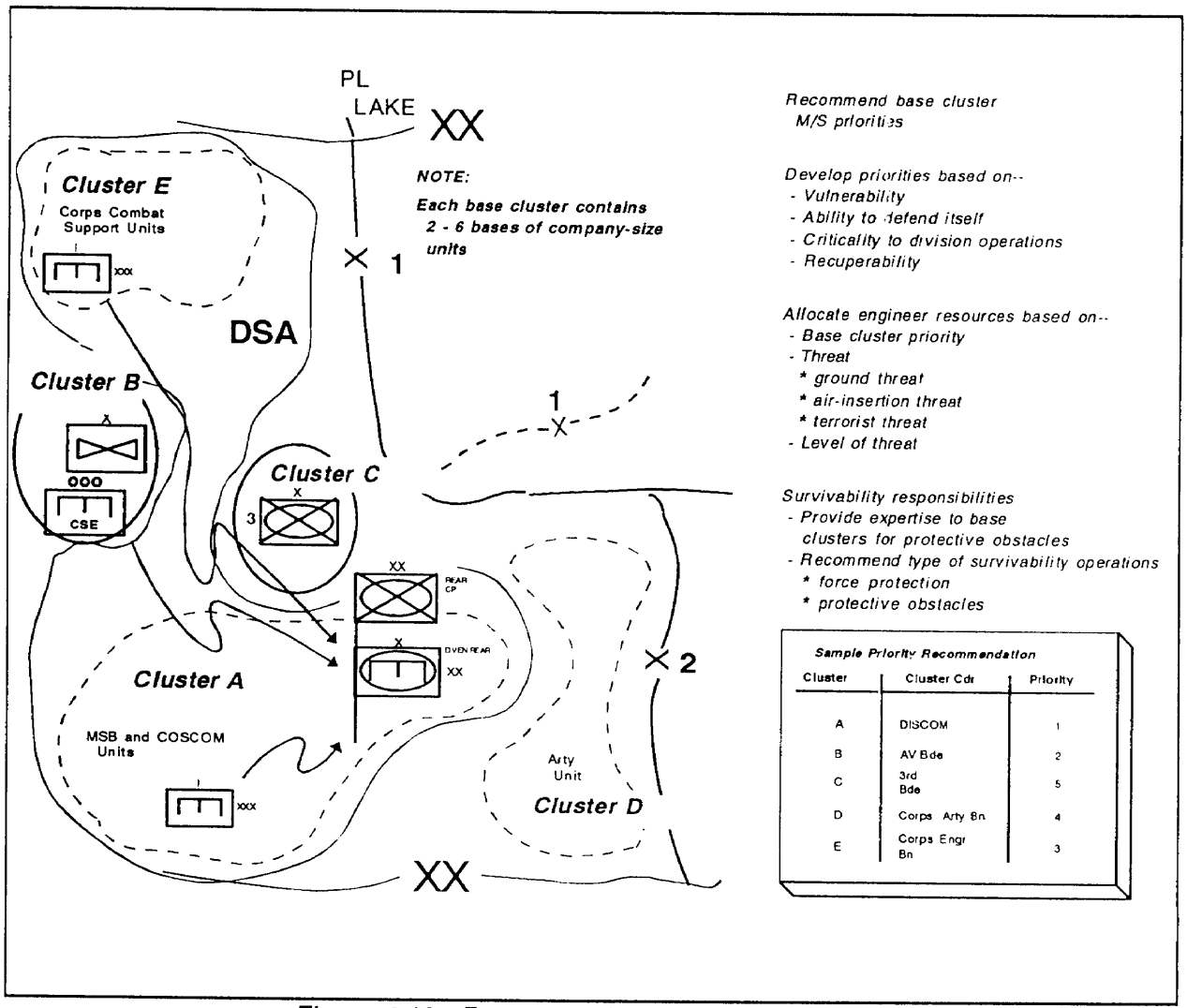


Figure 4-18. Rear operations and base clusters

Establishing priorities is only the first step. The threat must be understood and the base cluster defense designed to counter the threat. The following protective obstacle recommendations are based on the likelihood of the threat (threat levels) and whether the threat is ground-mounted, air-inserted, or terrorist:

- Ground threat - Protective obstacles are antitank (AT) heavy.
- Air-inserted threat - Protective obstacles are antipersonnel (AP) heavy, using AP mines and wire.
- Terrorist - Force-protection techniques are employed.

The division staff must assess the enemy's ability to deliver fires onto the division rear and its effect on sustainment operations. The DIVEN headquarters, along with the REAR CP, determines and prioritizes fortification efforts and requirements based on this assessment. The DIVEN headquarters resources Class IV supplies, blade equipment, and engineers based on these priorities and amount of effort.

The fortification and protective obstacle effort for engineers in the rear area fall into two categories: advisory and missions. The engineers in the rear area advise base cluster defenses on fortification techniques and quality control measures. The fortification missions for engineer forces focus on protecting key C2 nodes, equipment, and vital materials. The cluster priorities guide the DIVEN headquarters in allocating assets to the units in the rear area.

The DIVEN headquarters plays a major role in coordinating, tracking, and troubleshooting the division's push of Class IV/V (obstacle) supplies forward to the brigades. See Chapter 6 for a detailed CSS discussion. Their goal is to get corps assets to throughput the material to the task force sector and coordinate haul support dedicated to hauling obstacle material. The assault float bridge (AFB) company could also be used as a hauling asset, if their principal employment is not required. The DIVEN headquarters plans for other rear area missions as listed below:

- Rear area damage control.
- Host-nation support.
- Support to the tactical combat force.

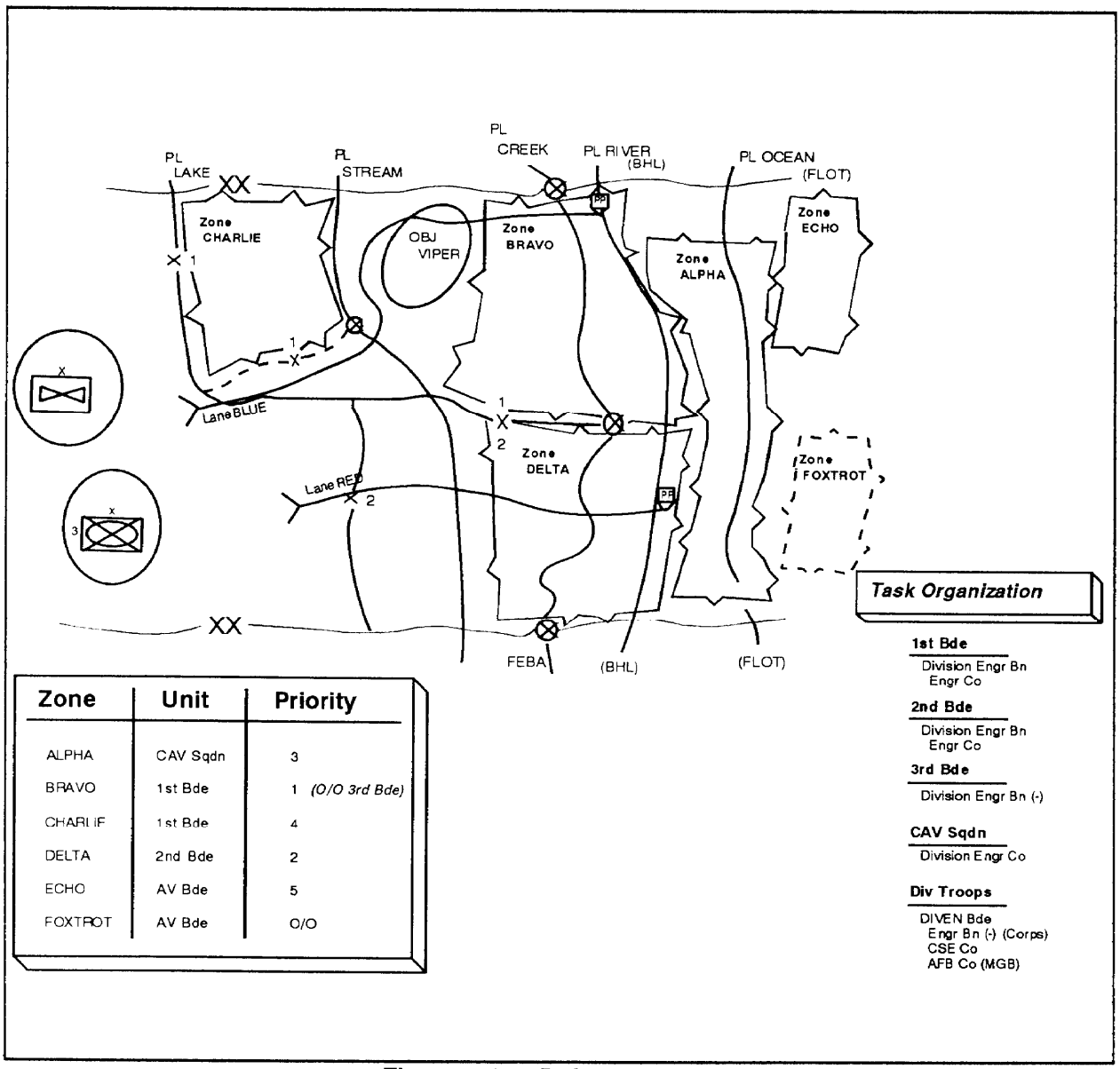
The engineer support and planning for rear operations require dedicated engineer representation at the REAR CP. Even though the MBA consumes the majority of the DIVEN headquarters's planning effort and engineer forces, support to the rear operations is essential to the success of the division's close operation.

Scenario Conclusion

The defensive framework is a tool that provides a structured analysis of the engineer requirements across the battlefield. Figure 4-19 shows the general overlay that would be an appendix to the engineer annex. The DIVEN headquarters will use the scheme of engineer operations, the subunit instructions, and the engineer annex of the division OPORD to put the plan into action. The obstacle zones and reserve obstacles are part of the maneuver brigades' subunit missions. The engineer brigade's OPORD will cover the division engineer battalion's task organization to lst, 2nd, and 3rd brigades and detailed instructions on the internal engineer brigade operations and engineer units under engineer brigade control.

ENGINEER SUPPORT TO A LIGHT DEFENSE

The light division is primarily organized, equipped, and trained to defeat light enemy forces. The light division is capable of defending against a mechanized enemy force in the right terrain and with the right mission when appropriately augmented with additional forces and support. Light forces capitalize on their ability to operate in restrictive terrain where mounted forces lose the tactical mobility advantage. The light division normally defends by assigning a sector to each brigade, allowing maximum freedom of maneuver for decentralized operations. Light brigades fight by positioning forces in depth from reverse slope positions along restrictive mobility corridors on carefully selected and prepared terrain. Light forces engage the enemy at choke points and obstacles with direct and indirect fires and then maneuver through the restricted terrain to alternate positions. In short, they use the entire sector to progressively slow and weaken the enemy. Positioning techniques and the careful use of terrain will deny the enemy the advantage of being able to bring total combat power to bear on the light force.



Zone	Unit	Priority
ALPHA	CAV Sqdn	3
BRAVO	1st Bde	1 *(O/O 3rd Bde)*
CHARLIE	1st Bde	4
DELTA	2nd Bde	2
ECHO	AV Bde	5
FOXTROT	AV Bde	O/O

Figure 4-19. Defense scenario

The DIVEN headquarters must understand the tactics employed by the light division in order to effectively integrate M / S operations into the division defense. Engineer planning focuses on each area of the defensive framework–deep, security, MBA, reserve, and rear operations. The DIVEN headquarters uses the engineer estimate to integrate all engineer functions (mobility, countermobility, survivability, topographic, and sustainment engineering) into the division planning process. The obstacle planning process (pages 4-16 through 4-18) is the tool for integrating obstacles into the division scheme of maneuver.

The following is a division scenario which illustrates the integration of engineer operations into the division defensive framework.

Division Scenario

The light division is attached to a joint task force (JTF) for this operation. The JTF is defending with a division in the north, the light division in the center, and a host-nation division in the south. The JTF commander has positioned the light division in an economy-of-force role in restrictive terrain. The division's mission is to conduct a defense in sector, deny the enemy use of a key mobility corridor, slow the enemy's momentum, and create opportunities for subsequent JTF attacks. The enemy is a mixed force consisting of both mechanized and light forces, with a mission to attack and destroy the JTF lodgment. Figure 4-20 shows the division's scheme of maneuver and the engineer organizations available.

The division will conduct the operation in three phases:

Phase 1 - Preparation/Counterreconnaissance.

Phase 2 - Covering force area (CFA) battle.

Phase 3 - MBA battle.

The following is a list of the key subunit instructions:

1st Brigade
1. Defend in the sector initially forward of PL BLUE.
2. Conduct the battle hand-off with the CAV squadron at PL GREEN.
3. Block dismounted avenue into 2nd brigade's sector.
4. Allow no penetration of PL RED by platoon-sized or larger elements.

2nd Brigade
Defend in the sector forward of PL BLUE, destroying first-echelon regiments.

3rd Brigade
1. Defend in the sector forward of PL RED, destroying remaining enemy elements.
2. Allow no penetration of PL RED by platoon-sized or larger elements.

Aviation Brigade
1. (Phase 1) Provide security for the division.
2. (Phase 2) Conduct security force operations between PL GREEN and PL BLACK.
3. (Phase 2) Conduct battle hand-over with 1st and 2nd brigades.
4. (Phase 3) Act as division reserve. On-order attack to destroy second-echelon regiments of the first-echelon division in EAs BEAR and LION.

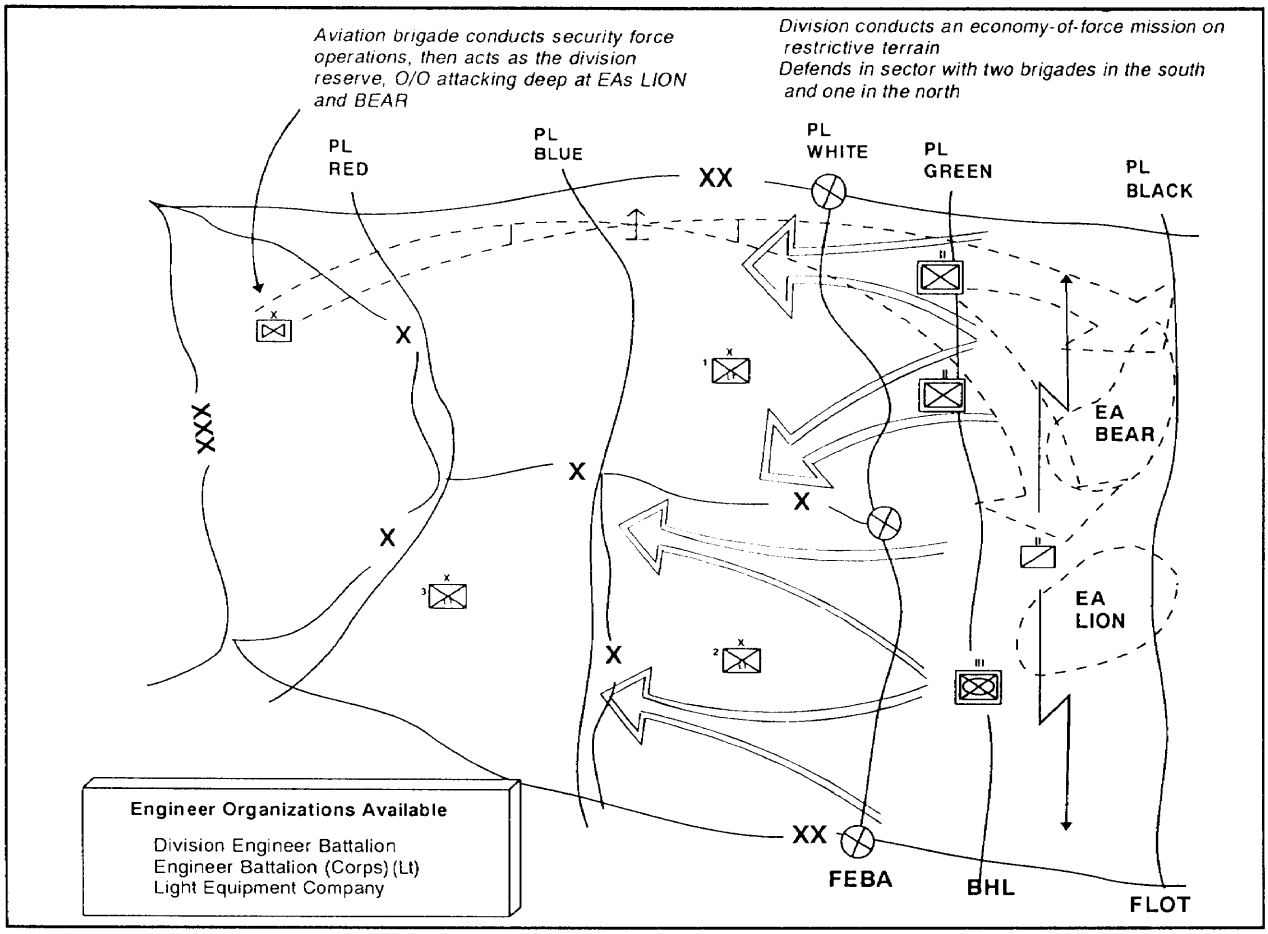


Figure 4-20. Defense scenario

Deep Operations

Deep operations are used to affect the closure times of follow-on enemy elements, creating windows of opportunity for MBA forces. Ultimately, they create the conditions that allow destructive actions against leading elements of follow-on divisions before the closure on defending brigades. Deep operations prevent the enemy from concentrating overwhelming combat power against the division's MBA forces. This is accomplished by separating the enemy's echelons and disrupting his C2, CS, and CSS. The division conducts deep operations to support the close-in battle. Airborne and air assault forces are uniquely suited for deep operations, along with close air support (CAS) and long-range fires.

Intelligence-collecting operations are key to light division deep operations. Deep intelligence assets are used to acquire HVTs, whose destruction will severely restrict the ability of the enemy to conduct offensive operations. Supporting the division's and JTF's collection effort are two important assets: the division long-range surveillance detachment (LRSD) and the special operations forces (SOF) element. Intelligence collected by these assets are integrated into IPB templates and become key components in the maneuver plan as well as in planning situational obstacles.

Collection operations are guided by PIR and IR developed to support the commander's concept of the operation. The DIVEN headquarters, along with the G2, can develop PIR and IR to support obstacle planning for deep operations. In this example, the DIVEN headquarters, in conjunction with the division staff, may focus on a TAI, which is an engagement point or area usually along an avenue of approach or a mobility corridor. The PIR and IR are focused at these areas with the intent to assist in situational obstacle planning. Once collected, this intelligence can greatly enhance the DIVEN headquarter's ability to support the deep battle.

If authorized, the DIVEN headquarters establishes an obstacle zone to support this employment of situational obstacles. The DIVEN headquarters, along with the G2 and G3, identifies the obstacle intent, locations, and timing in relation to the execution criteria and decision points. It is essential to coordinate these obstacle zones and planned situational obstacles with the special operations command and control element (SOCCE). This coordination assists deconfliction (the process of resolving conflicts between fires and other activities of units operating close to one another), minimizing the likelihood of fratricide and mutual interference. It also integrates SOF and LRSD C2 elements into the situational obstacle planning process, ensuring that the SOF and LRSD team activities (locations, missions, and extraction or exfiltration operations) are coordinated.

Security Operations

Security operations are designed to obtain information about the enemy and provide reaction time, maneuver space, and protection for the main body. Security operations are characterized by aggressive reconnaissance designed to reduce terrain and enemy unknowns. This is achieved by gaining and maintaining contact with the enemy to ensure a timely, continuous, and accurate information flow to the defending brigades. Security operations include screening, guard, and covering force operations. These operations are essential to the success of the division's defense. Figure 4-21 shows the CAV squadron conducting security operations for the division.

Restrictive terrain and narrow sectors are ideal for the CAV squadron (as the security force) to initially conduct a screen and later a guard mission. Providing early warning, they initially screen along PL BLACK. Once contact is made, the CAV squadron makes the transition to a guard force mission, destroying first-echelon regiments in an attempt to force their early deployment east of PL GREEN. To conduct the guard force mission, they will be supported by elements of the attack helicopter battalion (ATKHB), CAS, and indirect-fire assets. The DIVEN headquarters must understand the implications of the CAV squadron's screen mission and their subsequent transition to the guard force mission. Because of the importance of engineer support to the CAV squadron, an engineer planner is sent to the aviation brigade's CP.

The security force battle will be a decentralized and rapidly developing fight. The CAV must have maximum flexibility to employ tactical obstacles to ensure the mission's success. Zones ALPHA and BRAVO differ because of their terrains and avenues of approach. Zone ALPHA is restricted terrain with dismounted avenues of approach. Zone BRAVO is open terrain with high-speed avenues of approach. Figure 4-22, page 4-34, shows obstacle zones ALPHA and BRAVO extending from PL BLACK (initial JTF FSCL) to just forward of BHL PL GREEN. This provides obstacle employment freedom to the CAV commander, enhancing his ability to gain early contact with the enemy and to develop the fight throughout the security zone. Zones CHARLIE and ECHO extend just forward of the BHL back to the brigade's rear boundaries. Placement of these zones ensure that MBA units can control obstacle effort at the BHL. The DIVEN headquarters, in coordination with the

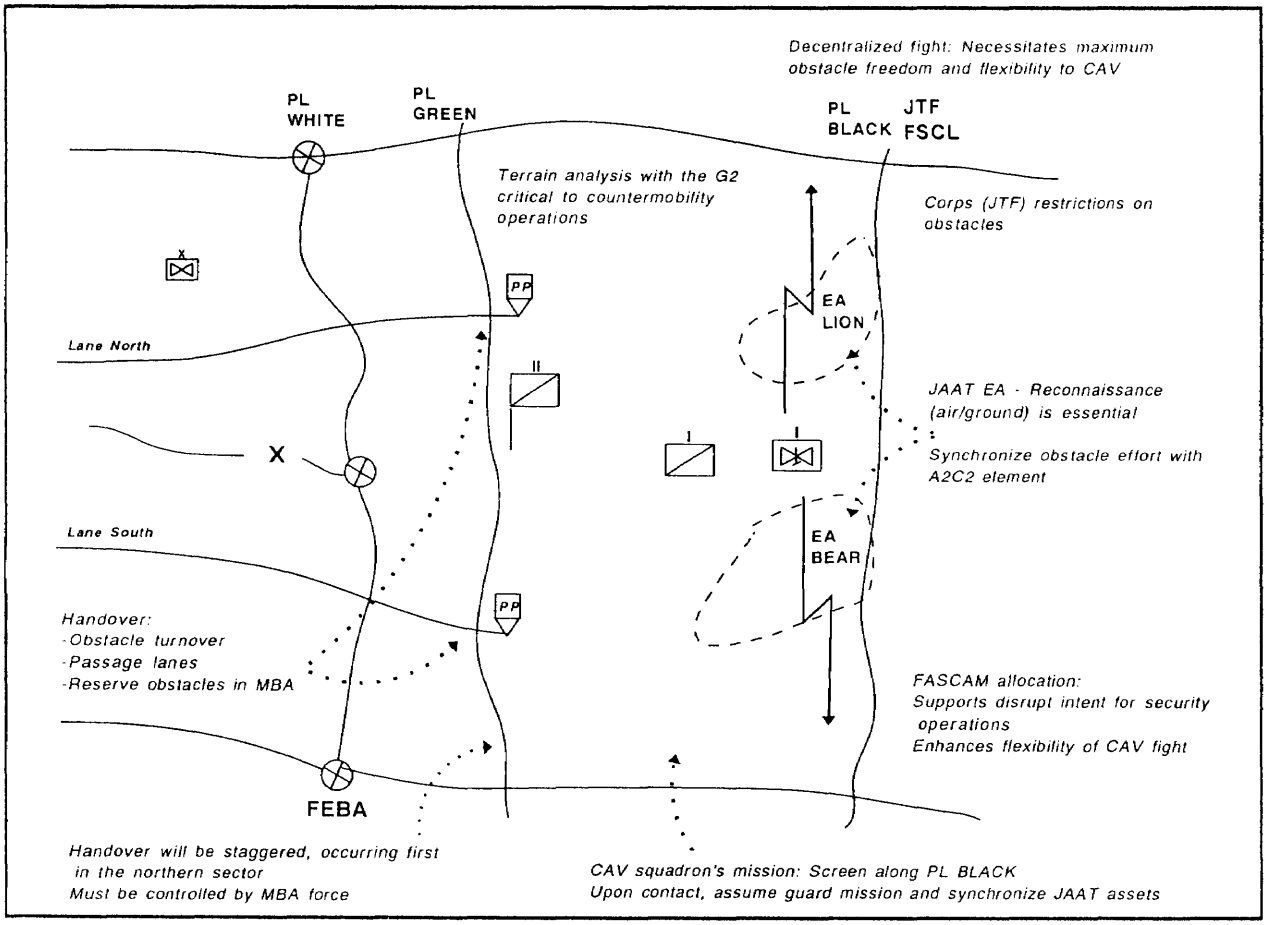


Figure 4-21. Security operations analysis

division aviation officer (DAO), anticipates that the CAV will employ four disrupt obstacle belts. In addition to conventional obstacles, the CAV can be reinforced with MOPMs, air and ground Volcanos, and ADAMs and RAAMS. Because the southern sector of the security zone is the high-speed avenue of approach into the MBA, the DIVEN headquarters and the DAO consider disengaging situational obstacles that assist the covering force in order to provide time and space for the battle handoff to occur. The covering force obstacle zone locations, intents, and subsequent execution are passed to the maneuver brigades to ensure their effect on the MBA is understood.

During phase 1, the CAV's primary mission is early warning and the destruction of enemy reconnaissance forces. Destruction of enemy reconnaissance elements degrades the enemy's ability to see into the. MBA's restrictive terrain. The CAV's supporting obstacles should focus on the destruction of reconnaissance elements and the disruption of enemy lead regiments. Point obstacles integrated with remote sensor devices from the military intelligence (MI) battalion can be employed in this role. Additionally, FASCAM obstacles properly integrated with all supporting fires enhance the CAV's security missions and aid in its transition to the guard mission.

M/S requirements are required for the ground CAV troop assets forward of PL GREEN (Figure 4-21). Engineers construct obstacles to support CAV engagement areas,

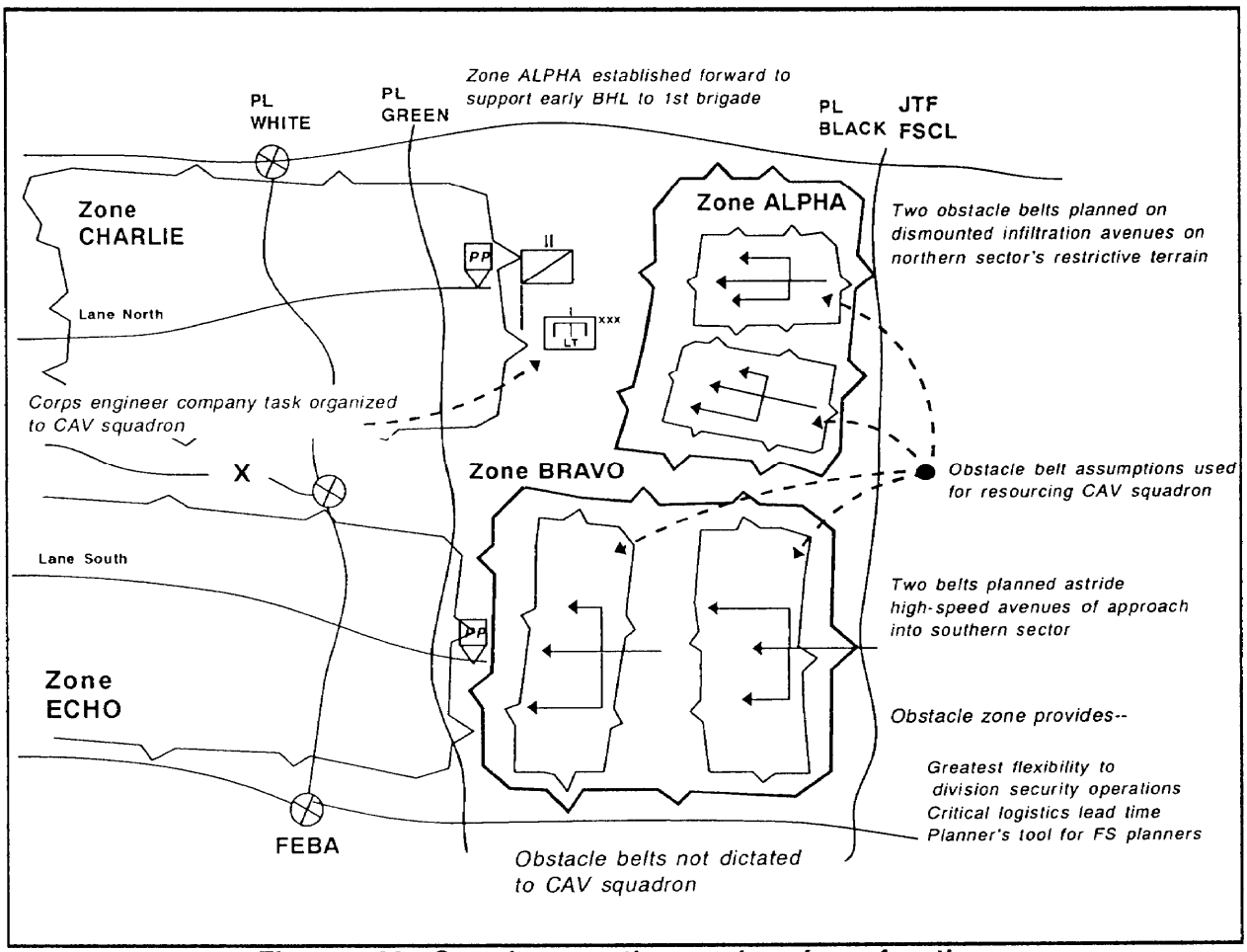


Figure 4-22. Security operations and engineer functions

construct forward area rearm/refuel points (FARPs), identify fording sites, mark lanes through obstacles, and synchronize lane closures. Limited combat trails and egress routes may have to be improved for this force. Survivability missions in the security zone will focus on ground AT systems, such as the tube-launched, optically-tracked wire-guided (TOW) high-mobility multipurpose wheeled vehicle (HMMWV), with sequential defilade positions being constructed from PL BLACK to FL GREEN. Figure 4-22 depicts a corps light engineer company task organized to support the CAV. Upon completion of engineer work in support of security operations, one corps light engineer platoon displaces to support 1st Brigade and the remainder of the company reverts to DIVEN headquarters control to support division rear operations.

MBA and Reserve Operations

Forces within the MBA fight the decisive defensive battle. They are positioned so that they can control or repel enemy penetrations. The MBA fight receives the majority of the DIVEN headquarter's planning effort. The division's use of the reserve must be addressed during MBA planning. Each of the three brigades has different engineer considerations in this situation. Figure 4-23 shows the MBA situation.

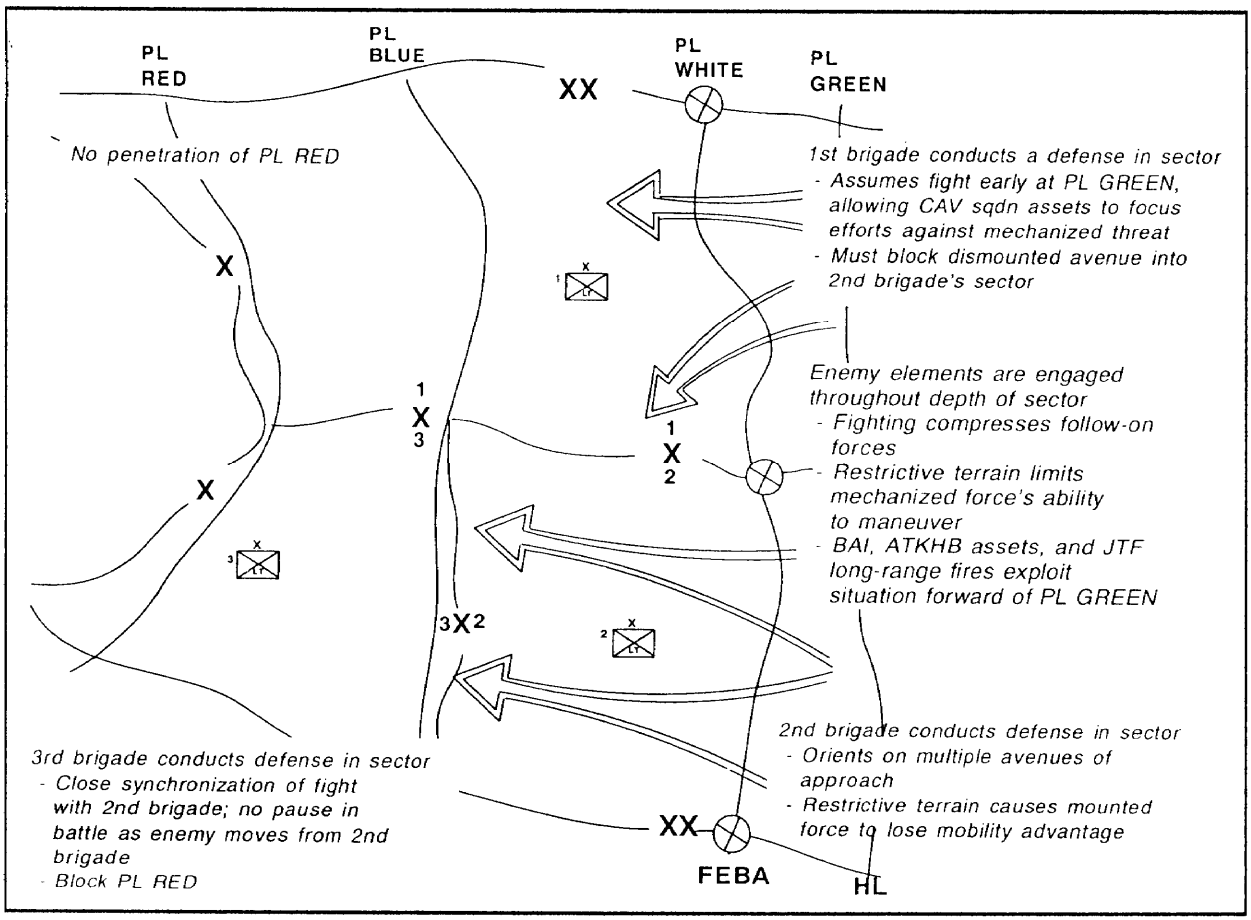


Figure 4-23. MBA operations analysis

1st Brigade. 1st brigade's sector is characterized by very restrictive terrain suitable for light infantry operations. Mechanized and wheeled cross-country mobility is limited to the few trails in the area. Their primary concern is enemy dismounted forces moving through the sector to the division rear and into 2nd brigade's sector from the north.

1st brigade will conduct a mobile defense, focusing on destruction of enemy forces throughout the depth of their sector. Using lift and supporting attack assets from the aviation brigade, 1st brigade will defend well forward of BHL PL GREEN. Early warning, provided by the CAV, indicates the direction, speed, and composition of the dismounted forces. After battle handover, 1st brigade will defend by focusing on the destruction of advancing enemy forces and fighting a series of battles in depth, attacking the enemy from the front, flanks, and rear while using minimal forces to maintain surveillance over the remainder of the sector. Tactical obstacles and battle positions are selected and prepared throughout the brigade sector on the most dangerous and likely avenues of approach. These tactical obstacles are integrated and synchronized with aggressive patrolling and ground surveillance radar (GSR) and remote sensor teams. The obstacle zones are designated and resourced to support the mobile defense in depth.

The DIVEN headquarters recognizes that terrain analysis is critical to conducting the fight. This analysis influences obstacle zone locations, intent and, ultimately, engineer

resource allocation. The DIVEN headquarters supports this by allocating resources for a turn, disrupt, and fixing belt in zone CHARLIE. Zone DELTA is resourced for the division directed block (Figure 4-24).

In order to plan and resource the engineer effort, the DIVEN headquarters war-games so that they will have a better understanding of how the brigade will fight. The DIVEN headquarters then resources belts, allowing the brigade to concentrate fires, disengage to subsequent battle positions, and destroy remaining enemy elements.

The DIVEN headquarters realizes that the battle hand-over will be staggered, occurring earlier in 1st brigade's sector. Therefore engineer work in the northern sector must be resourced to allow early completion. This allows security force assets to shift and attack mechanized enemy forces in the southern sector, forward of PL GREEN.

The DIVEN headquarters anticipates employing three belts in zone CHARLIE. A turn belt (C1) supports the critical task for the brigade to block the dismounted avenue of approach into 2nd brigade's sector. If this turning belt is employed by the brigade, the DIVEN headquarters must ensure that it is coordinated with 2nd brigade. A disrupt belt (C2) is aimed at breaking up command and control and forcing the enemy to piecemeal into the brigade's defense in depth. A fixing belt (C3) is focused at forcing

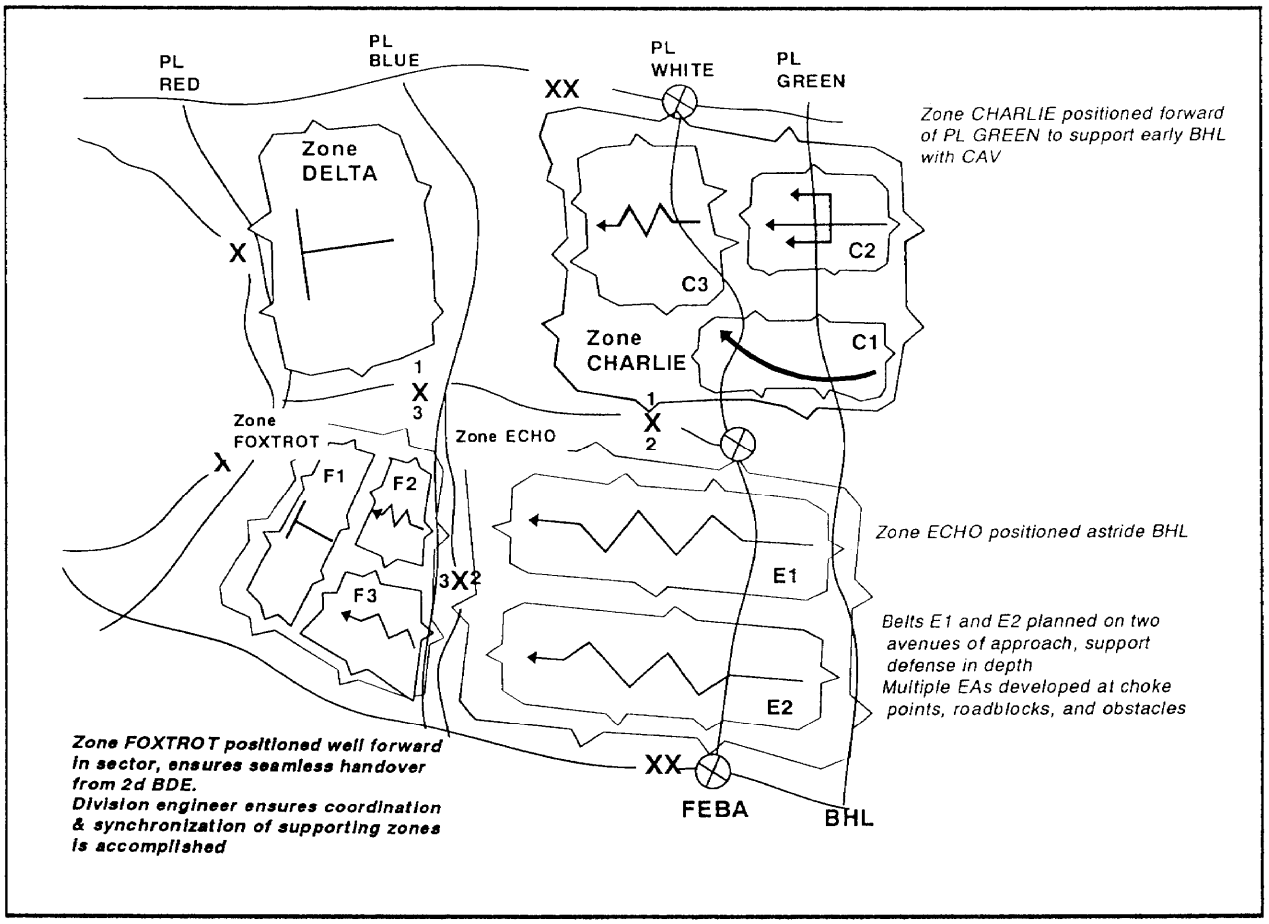


Figure 4-24. MBA operations and engineer functions

the enemy to breach repeatedly, significantly slowing his dismounted movement and facilitating 1st brigade's counterattacks. The block in zone DELTA, is aimed at the final destruction of any dismounted forces remaining in the sector and denying penetration of PL RED.

Although the DIVEN headquarters focuses its planning efforts on a dismounted threat, it is attentive to the possibility of mounted forces using the trail network in the brigade sector. Assets are resourced against this threat, and guidance is issued in the division order.

Protective obstacle effort by maneuver elements around the battle positions will be vital, particularly in zone DELTA. The DIVEN headquarters addresses Class IV/V obstacle logistic requirements, ensuring that tactical and protective obstacles are not competing for identical resources. Survivability support in this sector must start early. The habitual supporting division engineer company with equipment assets (from the parent engineer battalion's A&O platoon) is task organized by division to support 1st brigade's effort. The brigade will also receive an engineer platoon from the corps light engineer company initially task organized to the CAV. Mobility support is focused at egress routes for the ground CAV (as required) to support movement to subsequent battle positions and to improve or locate PZs and LZs for air assault counterattacks.

2nd Brigade. 2nd brigade sits astride the only high-speed avenue of approach in the division sector. Rapid, mounted movement through the sector is limited to roads and trails. Cross-country movement of wheeled and tracked vehicles is either slow or impossible. Significant obstacle effects are gained by reinforcing natural obstacles and terrain. A detailed terrain analysis, verified by ground reconnaissance, is fundamental to maximizing engineer effort in this sector.

War gaming reveals that 2nd brigade will conduct an area defense around mutually-supporting static positions deployed in depth. This allows for best use of the defensive terrain throughout the depth of their sector, engaging the enemy from the flanks and rear.

Significant engineer effort must be committed to allow this force to fight and win against a more mobile and protected force. One division engineer company with A&O equipment assets and one corps light engineer company are task organized to support this brigade.

Supporting the commander's intent of having a strong defense forward, zone ECHO is resourced for two fixing belts (E1 and E2) astride the sector's two battalion avenues of approach. This facilitates slowing the attack and fighting throughout the depth of the sector. This effort must be coordinated with the ground CAV's potential passage through 2nd brigade's sector.

3rd Brigade. 3rd brigade assumes the fight from 2nd brigade at their eastern boundary. The terrain in 3rd brigade's sector is identical to that of 2nd brigade's. The two avenues of approach that started forward of PL GREEN continue through 2nd brigade and throughout the depth of 3rd brigade's sector.

The terrain favors an area defense around mutually supporting static positions deployed in depth. The brigade commander must not allow any penetration of PL RED by elements larger than a platoon. By applying the METT-T analysis to the western half of the sector, it is anticipated that the brigade commander may employ strongpoints or battle positions to conduct his defense. Therefore, planning conducted by the DIVEN headquarters addresses both methods of defense and the transition between them.

The DIVEN headquarters anticipates that the brigade will employ two fixing belts and a block belt. This supports the seamless transition of the MBA fight between 2nd and

3rd brigades and the denial of enemy penetration of PL RED. The DIVEN HQ ensures that the obstacle effort around the two brigade boundaries is coordinated and synchronized.

As in 1st brigade's sector, the block belt requires more protective obstacles and survivability effort. Enemy forces will attempt to dismount in order to clear 3rd brigade positions supporting the blocking belt to continue the attack. Increased direct and indirect fires, as well as dismounted assaults, will be employed by the enemy. This is the final area in the MBA that the division can complete the destruction of enemy mechanized forces.

The engineer tasks to support 3rd brigade are the most extensive and critical in the division. Accordingly, the brigade receives the priority of engineer support. A division engineer company with A&O equipment assets and a corps light engineer company are task organized to the brigade.

Aviation Brigade. The aviation brigade has three distinct missions. First, it conducts security force operations in phases 1 and 2. Next, the brigade is the division reserve in phase 3. Last, they have the on-order mission in phase 3 to conduct a supporting attack to destroy second-echelon regiments of the first-echelon division in EAs BEAR and LION. The aviation brigade's security operations have already been discussed. Its reserve mission will be covered later in reserve operations.

The aviation brigade requires tactical obstacles in EAs BEAR and LION to support its attack against second-echelon regiments (Figure 4-25). Obstacle zones ALPHA and BRAVO used during security operations are still in effect to develop JAAT EAs BEAR and LION. The DIVEN headquarters assists the aviation brigade in planning tactical obstacles which will reinforce the executed obstacles from security force operations in obstacle zones ALPHA and BRAVO. The DIVEN headquarters recommends the aviation brigade plan obstacle belts specifically for EAs BEAR and LION, which are effective in phase 3.

Only FASCAM systems can support the aviation brigade during this supporting attack forward of PL GREEN. The DIVEN headquarters contemplates which scatterable mine assets to allocate to the brigade. Ground-emplaced assets are ruled out immediately due to the lack of ground security. Air Volcano is an option. The division must consider the status of SEAD missions and the ability of the enemy to engage B1ackhawk delivering the mines. This may rule out air Volcano as the choice asset. Gator could be used, if allocated, and SEAD/JSEAD missions target local threats. ADAMs and RAAMS are available. ADAMs and RAAMS allocations are coordinated with the FSCOORD to support the aviation brigade.

The allocation of scatterable mines and the priority of employment will shift to the aviation brigade during their supporting attack. An engineer staff planner is sent to the aviation brigade to assist in planning obstacle belts and the integration of scatterable mine assets.

Reserve Operations

Early in the planning stages, the division commander makes fundamental decisions concerning the size, composition, and mission of the reserve. The primary purpose of the division reserve is to preserve the commander's flexibility of action. Secondary purposes of the reserve are–

- Reinforcing the defense of committed forces.
- Containing enemy forces that have penetrated the FEBA.
- Reacting to rear area threats.
- Relieving depleted units and providing for continuous operations.

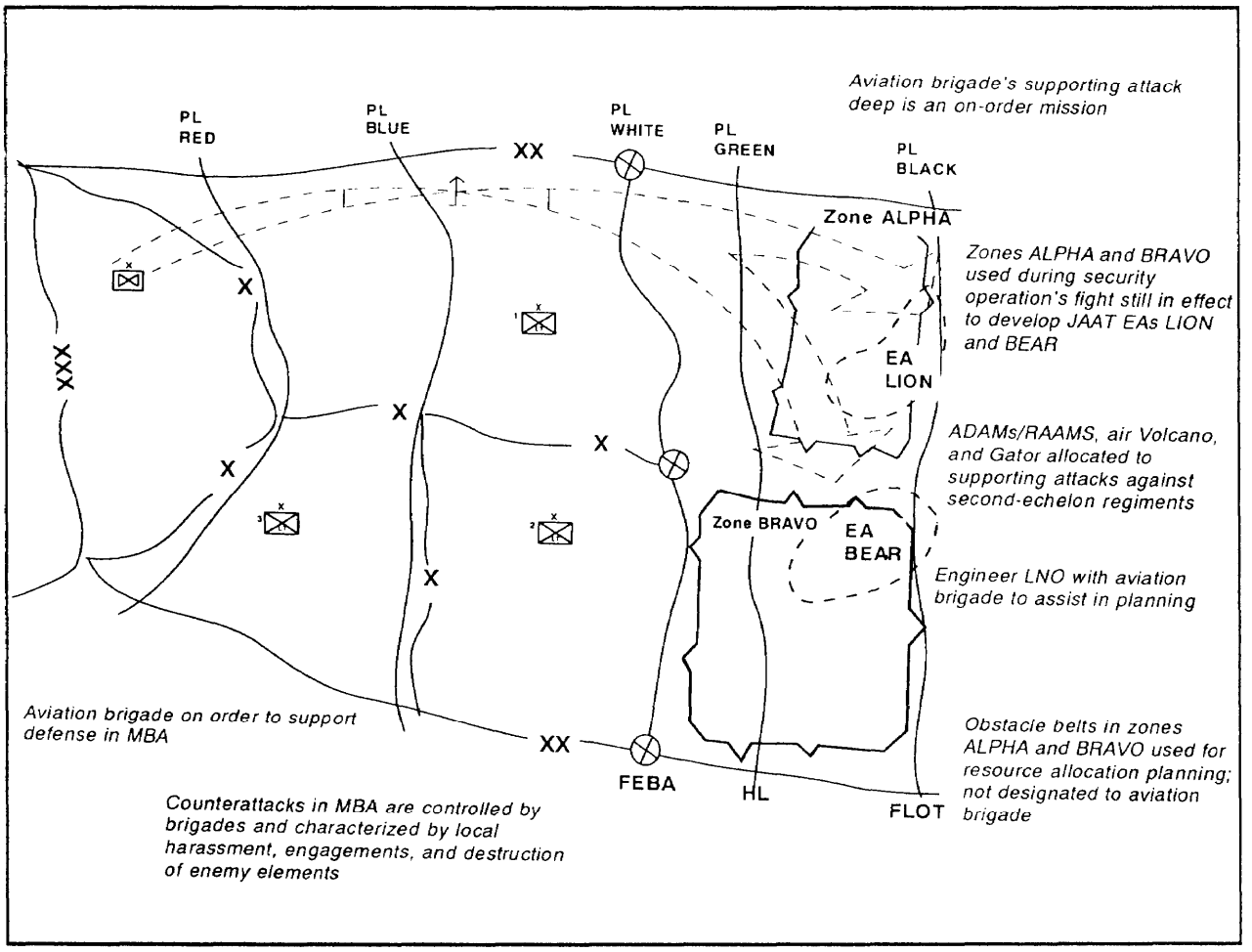


Figure 4-25. MBA supporting attack analysis

The aviation brigade is selected as the division's reserve in this example. The brigade's attack assets, in conjunction with other CAS and indirect-fire assets, provide the division commander with the speed, firepower, and flexibility required of this force. It must be capable of reacting quickly anywhere in the division area. If the aviation brigade does not incur significant degradation in its capabilities during the reserve mission, it will attack deep into EAs BEAR and LION.

The DIVEN headquarter's primary assets in supporting the division's reserve operations are situational obstacles using FASCAM assets. These are the only assets available that provide the speed and flexibility for obstacle emplacement that is dictated by the committal of the reserve.

In this example, ADAM and RAAMS or air Volcano are the best assets to support the reserve operations. Because of the decentralized nature of this defense scenario, fratricide deconfliction is a principal concern during the planning and execution of these obstacles. Control measures are enacted over these systems, with authority for execution held initially at division level. Final execution authority is given no lower than the aviation brigade commander. It is important that the DIVEN headquarters ensures coordination is con-

ducted with all three MBA brigade commanders concerning the reserve force situational obstacle plans.

Rear Operations

As outlined in Chapter 1, the objective of division rear operations is to ensure freedom of maneuver and continuity of operations through sustainment. Figure 4-26 shows the rear operations analysis. The DIVEN relies heavily on corps engineer support to the division's rear operations. In this situation, the DIVEN headquarters assigns rear area missions to the light equipment company and the corps light engineer company (-) (under DIVEN headquarters control after security operations work).

The DIVEN headquarters uses three levels of threat activity as a guide in planning rear operations support, concentrating on the division's needs to sustain and protect the force. Rather than focusing on the size or type of threat, these levels focus on the nature of the division's response to defeat the threat and the subsequent level of engineer support to enhance this response. Figure 4-27 shows engineer functions in the rear area.

Mobility requirements for the DIVEN headquarters extend throughout the division rear area and up to the BSAs. Corps engineer assets are assigned route clearance contingency missions in anticipation of the enemy employing scatterable mines. Clearing UXO

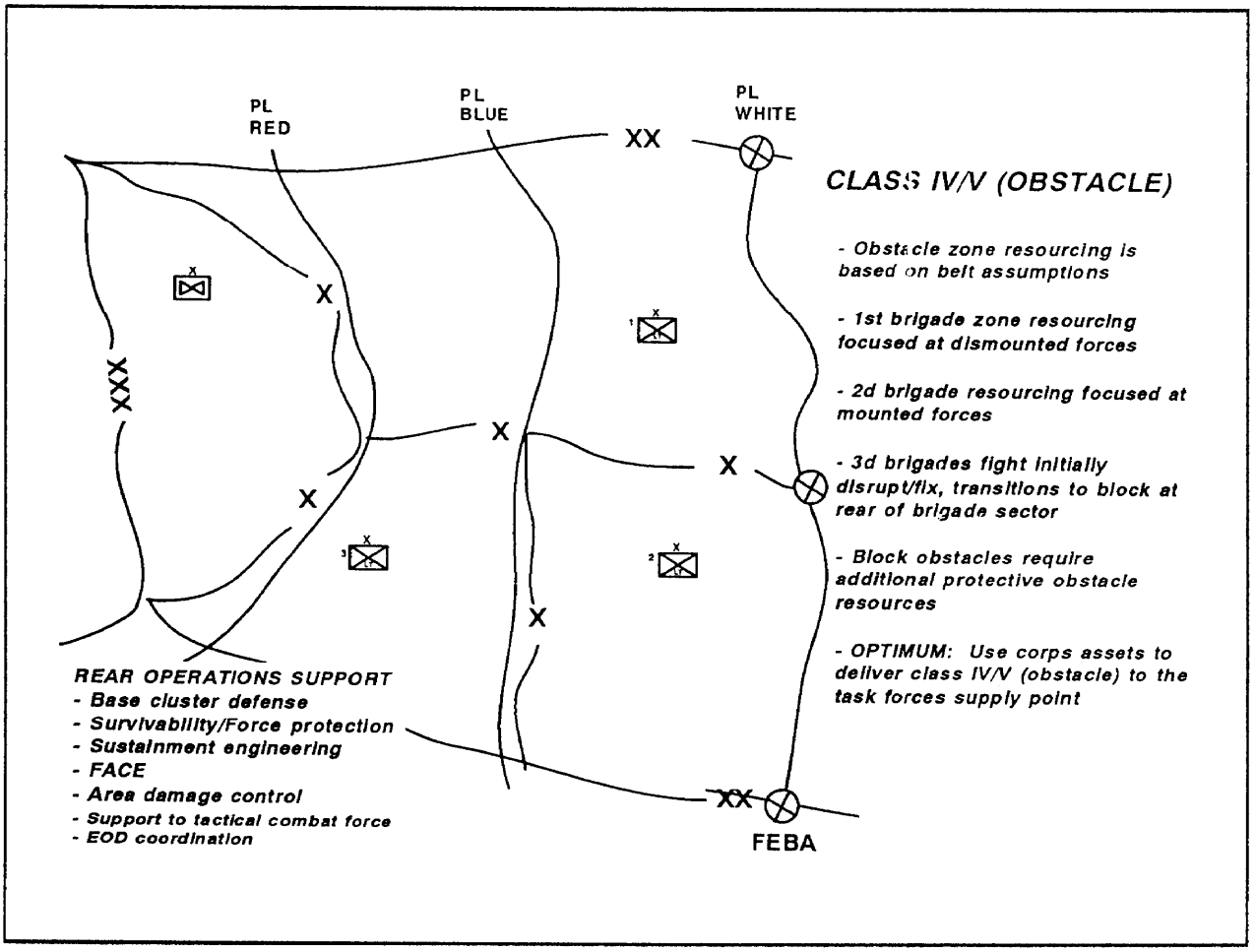


Figure 4-26. Rear operations analysis

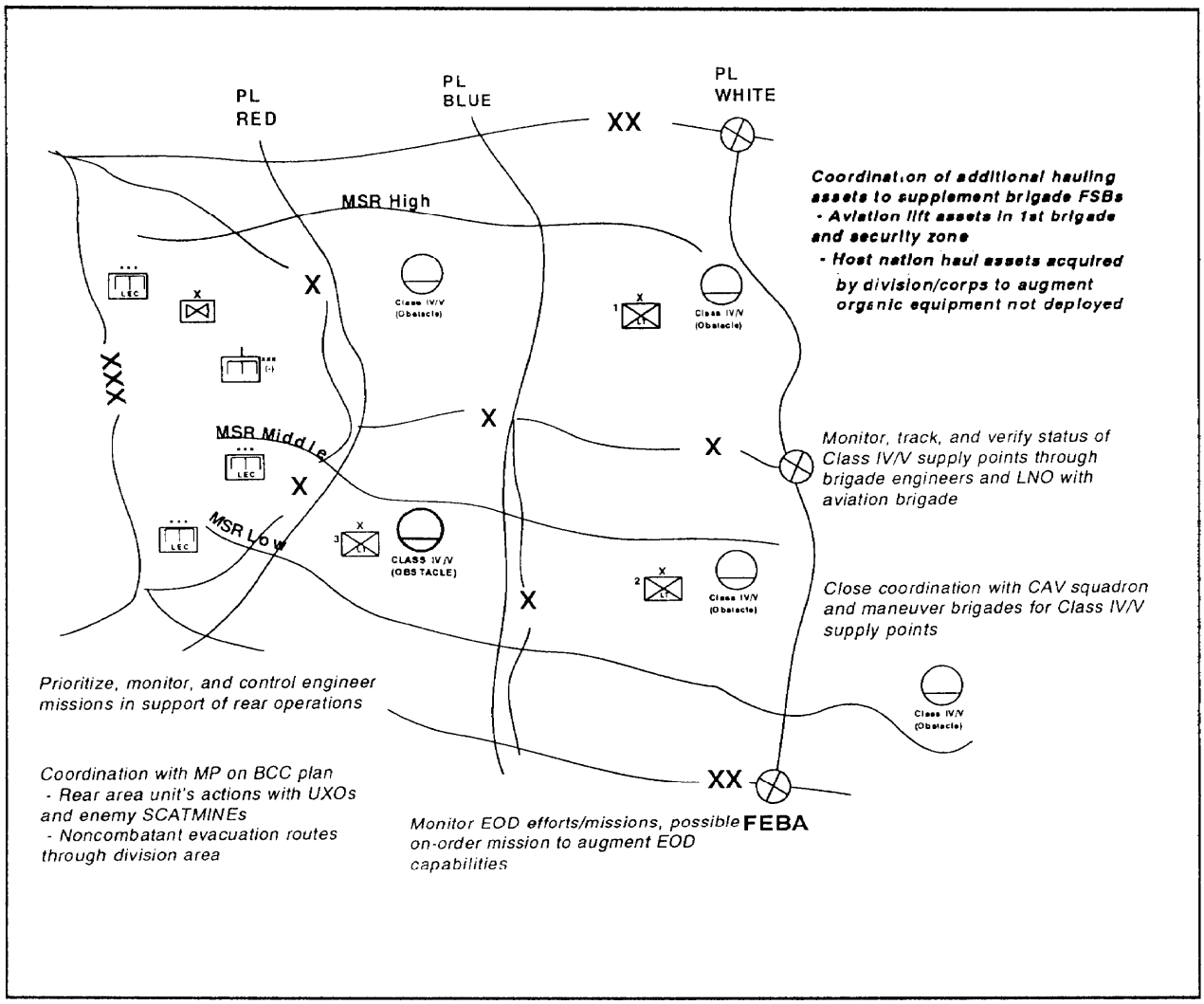


Figure 4-27. Rear operations and engineer functions

is an EOD mission. Requests for EOD support are sent to the division REAR CP for action. If EOD support is not available or the saturation of UXOs is too great for an EOD unit, engineers can assist in this mission. The division REAR CP tracks EOD missions when the UXO area directly affects the division's mission.

Survivability support is essential in maintaining combat operations. Engineer survivability support is provided through fortifications and protective obstacles. The DIVEN headquarters, along with the REAR CP, has the responsibility of planning for the survivability of all assets in the rear area. Engineer support is then integrated with the base and base cluster defense plan. Figure 4-28, page 4-42, shows an example. The DIVEN headquarters recommends priorities of engineer support to the division REAR CP. The priorities are based on four factors balanced against the threat level:

1. Vulnerability of the base cluster.

2. Self-defense ability of the base cluster units.

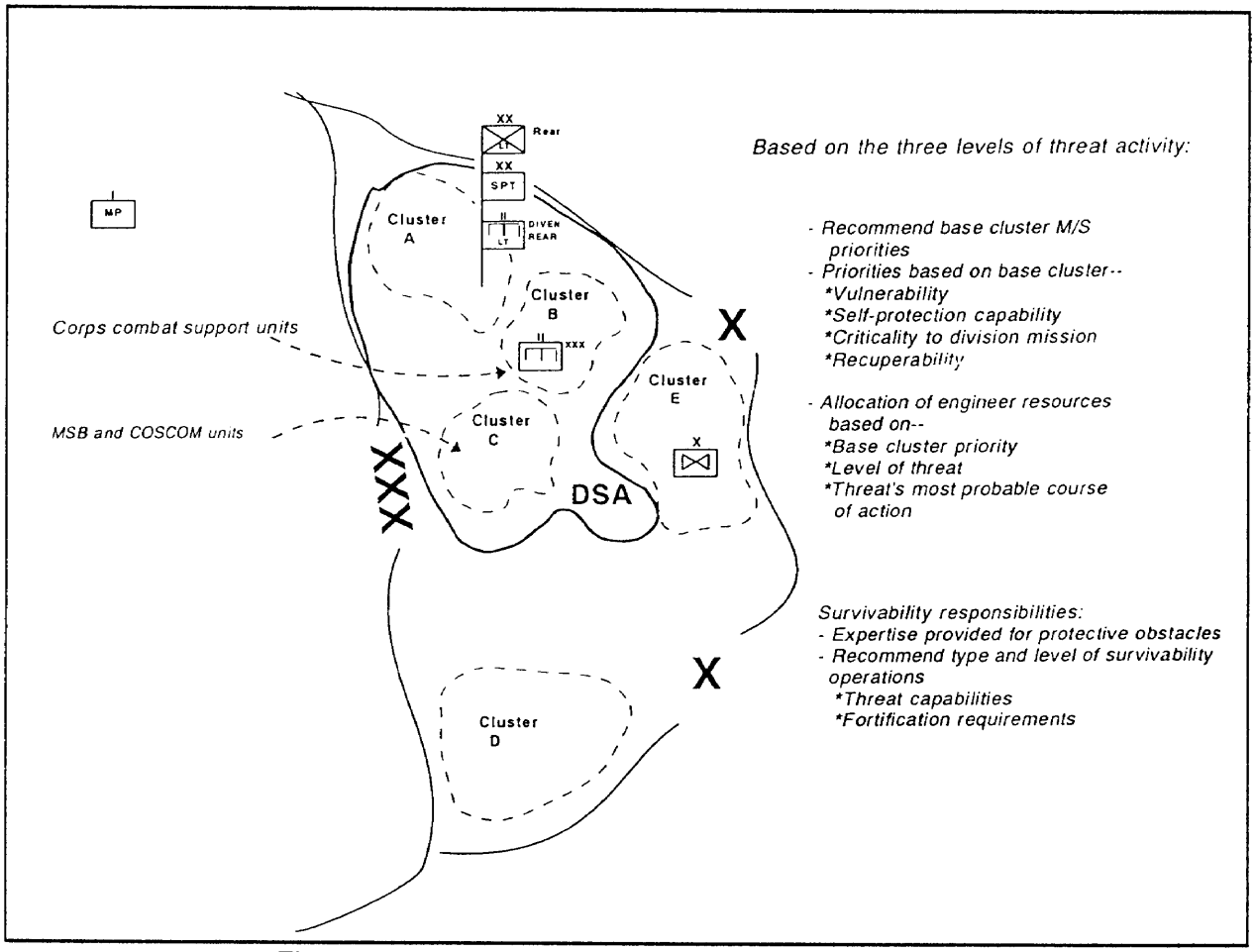


Figure 4-28. Rear operations and base cluster support

3. Criticality of the unit to the success of the division mission.

4. Recuperability of the unit and its assets in the base cluster.

Once the priorities are established, the threat level must be understood and the base cluster defense must be designed to counter the threat's most probable course of action. Obstacle recommendations to support rear area operations are also based on the three threat levels outlined in Table 4-1.

The DIVEN headquarters, in coordination with the G2, must assess the enemy's ability to deliver fire into the division rear and its effect on sustainment operations. Using the same process outlined for obstacles, the DIVEN headquarters, along with the REAR CP, determines and prioritizes fortification efforts and requirements. Engineer blade and troop effort, as well as Class IV supplies, are then resourced by the DIVEN headquarters.

The fortification and obstacle effort for engineers in the rear area fall into two categories: advisory and missions. Engineers in the rear area advise base cluster defenses on fortification techniques and quality control measures. Fortification missions for engineer forces focus on protecting key C2 nodes, equipment, and vital material.

Table 4-1. Threat levels

THREAT LEVEL	OBSTACLE RECOMMENDATIONS
Level I. Characterized by enemy-controlled agent activities, sabotage by enemy sympathizers, and terrorist activities.	Protective wire, AP mines integrated with remote sensors and GSR, cover-from-view screens, predetonation fences, blast zones, and antivehicular barricades.
Level II. Characterized by diversionary and sabotage operations conducted by unconventional forces and raids, ambush, and reconnaissance operations conducted by small combat units.	Same as Level I; increased densities of initial protective measures.
Level III. Characterized by heliborne, airborne, amphibious, ground-force deliberate, and infiltration operations.	AT mines, berms, wires and ditches; FASCAM (and conventional obstacles) planning for potential LZs and DZs; and infiltration route denial around base and base clusters.

Established cluster priorities guide the DIVEN headquarters in allocating assets in the rear area.

Coordinating, tracking, and pushing Class IV/V (obstacle) supplies forward to the brigades is a major concern for the DIVEN headquarters. Chapter 6 details the CSS process for the light division. The goal of the DIVEN headquarters is to get corps assets to throughput the material to the task force sector and coordinate dedicated haul support for moving the material once it is delivered. Transportation assets in the division support command are vital. The lift assets in the aviation brigade provide rapid and flexible haul support in restrictive terrain.

Other rear area missions the DIVEN headquarters plans for are–

- Rear area damage control.
- Host-nation support.
- Support to the tactical combat force.

Synchronized and integrated engineer support and planning for rear area operations require dedicated division engineer representation at the REAR CP. Although the MBA consumes the majority of the DIVEN headquarter's planning effort and engineer resources, support to the rear operations is essential to ensure the commander's freedom of maneuver and the success of the close operation.

Scenario Conclusion

As with the armored division, the defense framework provides a structured analysis of the engineer requirements across the battlefield. The DIVEN headquarters uses the scheme of engineer operations, subunit instructions, and the engineer annex of the division OPORD to execute and synchronize the plan. Obstacle zones and reserve obstacles are part of the maneuver brigade's subunit missions. The engineer battalion's OPORD covers the division engineer company's task organization in support to the covering force, main battle, and rear area operations. It also covers detailed instructions on internal engineer battalion operations and other engineer units under the engineer battalion control.

ENGINEER PRINCIPLES FOR MIXED OPERATIONS IN THE DEFENSE

Armored and light forces can operate together effectively provided the division commander tailors his force to the factors of METT-T. The employment of mixed forces permits the commander to maximize his combat power by offsetting the inherent weaknesses of one force with the strengths of another. The assumptions are that the task-organized force comes with its habitually associated division engineer unit. The DIVEN headquarters must understand characteristics, strengths, weaknesses, and typical employment doctrine of each task-organized maneuver force and their supporting engineers.

The DIVEN headquarters performs several techniques to smooth the transition to mixed operations:

- Maintains habitual and force relationships between division engineers and their supported maneuver force:
  - Armored division engineer battalion per armored brigade.
  - Armored division engineer company per armored battalion.
  - Light division engineer company (with habitual A & O assets) per light brigade.
  - Light division engineer platoon (with habitual A & O assets) per light battalion.
- Shares tactical SOPs, ensuring synchronization of engineer battlefield functions.
- Exchanges liaison officers between armored and light division engineer units.

As with the armored maneuver unit, special consideration must be given to CSS capabilities. It is easy to absorb light forces into an armored division's logistical system, but it is virtually impossible for light divisions to provide the necessary armored logistical support. The task-organized armored force must become self- supporting. For example, the armored division engineer company must be task organized with a logistics support package from the division engineer battalion's support platoon.

In the defense, the light maneuver units defend best in restrictive terrain. Normally, less countermobility effort is required through the use of point obstacles rather than long, linear obstacles. The light division engineer's support is tailored to this effort. Even though less bulk of Class IV/V (obstacle) supplies material is moving forward, the delivery of the supplies must be to the obstacle location. For armored division engineer units, the delivery can be to Class IV/V (obstacle) supply points. The survivability effort of the light force concentrates on the use of SEEs to provide individual and crew-served fighting positions, while for the armored force, the concentration is on the use of armored combat earthmovers (ACEs) and vehicle-fighting positions.

CHAPTER 5
OTHER TACTICAL OPERATIONS

The division conducts other tactical operations to support both offensive and defensive operations. In many cases, these operations are an inherent part of an offensive or defensive plan. In all cases, they require special considerations during planning and execution. The division engineer must have a fundamental understanding of these operations and their inherent special engineer considerations. The engineer missions involved in supporting other division operations are essentially the same as those outlined for offensive and defensive missions. Furthermore, the principles of C2 of engineers still apply during planning and execution. The division engineer uses the special considerations below to refine the offensive or defensive engineer mission analysis and force allocation.

RETROGRADE OPERATIONS

A retrograde operation is an organized and orderly movement of forces to the rear of or away from the enemy. A division may be forced to conduct a retrograde operation due to enemy action or when directed by corps. There are three basic types of retrograde operations: delay, withdrawal, and retirement. A delay is an operation in which the division trades space and time to inflict maximum damage on the enemy without decisive engagement. A withdrawal is an operation in which a division in contact withdraws to free itself for a new mission. A retirement is an operation in which a division not in contact moves away from the enemy. A division normally conducts a retrograde by combining a delay, withdrawal, and retirement in simultaneous or sequential action. For example, a portion of the division may conduct a delay to facilitate the division withdrawal and retirement.

There are four major underlying considerations in planning and executing any retrograde operation. They are–

- **Leadership and morale.** Commanders at all levels must maintain the offensive spirit among subordinate leaders and troops during the retrograde operation.

- **Surveillance and reconnaissance.** Tracking the enemy situation must be aggressive and accurate; it becomes critical as forward combat power is reduced.

- **Mobility.** The division must achieve superior mobility advantage over the enemy force by providing for division mobility and degrading that of the enemy force.

- **Battlefield deception.** Deception operations target the enemy force to cause indecision and delay enemy actions and to prevent him from concentrating combat power at friendly weaknesses.

While the division engineer organization contributes to each of these fundamentals, the dominant role of engineers is in achieving superior mobility over the enemy. When still in contact, division retrograde operations require centralized planning and control and decentralized maneuver against the enemy. Delaying and withdrawing brigades and squadrons in contact with the enemy require maximum freedom of action to maneuver and degrade the enemy's maneuver. Therefore, the division engineer assists the division in achieving a mobility differential by allocating the necessary engineer forces and scatterable mine assets to forward units. He recommends an engineer task organization that supports in-stride breaching down to the task force level. Additionally, the division engineer must plan obstacle zones that permit flexible use of scatterable mines with execution released to forward commanders.

The DIVEN organization also contributes to division reconnaissance and surveillance. The division engineer works with the division staff in focusing intelligence-collection efforts on key information requirements that indicate enemy strengths, weaknesses, and intentions. The division engineer assists the division G2 cell in analyzing combat intelligence, particularly enemy engineer activities. For example, a delaying unit may report a concentration of low-density breaching assets indicating the location of the enemy's main effort. The division engineer also assists in developing information requirements that trigger high-value targeting. For example, he may plot the location and employment of enemy assault bridges, recommend their location as a PIR, and recommend their destruction as a HVT.

Engineers contribute the most to the delay and withdrawal phases of a retrograde operation. The focus of engineer missions is again on mobility and countermobility. The division engineer recommends a task organization of the division and supporting corps engineer battalions to provide mobility and countermobility support to the forward units in contact and enhance the mobility of division units not in contact. In order to expedite the rearward movement, corps engineer units construct, improve, and maintain withdrawal routes for combat, CS, and CSS units.

RELIEF IN PLACE

A relief in place is a combat operation in which all or part of a division in a combat area is replaced by another division. It is normally ordered when the relieved unit is in either a hasty or a deliberate defense. The relieving unit usually assumes the same defensive responsibilities and initially deploys the same as the relieved division. Key considerations in planning and executing a relief in place are–

- **Secrecy.** Because of the inherent vulnerabilities created by a relief in place, the operation must be concealed from the enemy for as long as possible;
- deception and operations security (OPSEC) are all-important from the outset.
- **Speed.** Relief operations are extremely vulnerable to enemy spoiling attack once they begin. Unnecessary delays during execution must be avoided to prevent giving the enemy time to acquire, target, and mass fires on the relief.
- **Control.** Intermingling forces place increased demands on division C2, particularly if enemy contact is made during the relief.

Engineers contribute the most to a relief in place by assisting the division in achieving speed and control. Therefore, these become the focus of the relieving and relieved division engineers during joint planning and execution. As the two division G3s collocate to develop the maneuver plan for the relief in place, the division engineers develop a unified scheme of engineer operations. Both division engineers must fully understand the entire scope of the mission, including the defensive plan and concept for the relief in place. Understanding both the defensive plan and the relief-in-place plan are critical to determining the engineer tasks that must be accomplished to maintain speed and control during the operation. Engineers help achieve this by–

- Providing mobility to both the relieving and relieved units.
- Expediting the turnover of obstacles.

The division engineers of both the relieving and relieved units must recommend engineer task organizations that provide in-stride mobility operations to battalions moving to, through, and from friendly defensive positions. Collocated CPs also facilitate speed through a rapid but thorough turnover of obstacles. Obstacle locations, configuration, and composition are consolidated and provided to the relieving unit. The two division engineers must also develop detailed plans for the turnover of division reserve targets and situational obstacle plans. Actual turnover is effected at the subordinate unit level.

The division engineers assist their respective divisions control of relief-in-place operations by providing detailed mobility planning, developing a detailed obstacle-turnover plan, and providing LNOs to maintain engineer continuity during the relief. When planning for mobility operations, division engineers review the relieved unit's defensive plan overlaid with the relief-in-place concept. The routes for the entering and exiting units must be clearly identified and marked. The division engineers determine mobility tasks that are required on each route. The relieved division has the responsibility to fully prepare the routes through its sector. The relieved division engineer allocates mobility resources to assist in the preparation of these routes. Additionally, both division engineers must ensure that their respective divisions have the capability to conduct in-stride breaching operations in the event a lane is closed during movement.

When developing the obstacle-turnover plan, the relieved division engineer must have detailed and current status on the obstacles in his sector. While initially focused on obstacle control measures, he now focuses on individual obstacles and compiles a complete obstacle list and overlay. He receives updated obstacle reports from all subordinate units and determines the details of how the obstacles are to be exchanged, to include reserve targets and situational obstacles.

The presence of engineer LNOs at every echelon of the relieving unit down to maneuver company or team level is critical to the speed and control of obstacle turnover. Upon linkup, engineer LNOs with the relieving units become thoroughly familiar with the existing obstacles, including the direct- and indirect-fire control measures integrated with the obstacles. The LNO then assists the relieving maneuver commander in integrating existing obstacles into the current maneuver plan. The relieving engineer also advises the maneuver commander on plans for upgrading the defense to allow for any adjustments made to the defensive plan. Rapid, efficient turnover is critical for two reasons. First, it ensures that the maneuver commander is immediately capable of using the existing obstacles as a combat multiplier in defeating the enemy. Second, it expedites shifting engineer effort from obstacle turnover to improving the unit's defensive posture or preparing for the subsequent attack.

PASSAGE OF LINES

A passage of lines is an operation in which one force moves through another. A passage of lines can be conducted either forward or rearward. The engineer considerations for each are similar and depend more on whether the division is *passing or in-place.* Major considerations are–providing the passage of engineer control, the exchange of information, and the mobility of the passing force.

The passage of control between passing and in-place divisions is one of the key considerations in any passage of lines. The commanders of the two divisions must establish a mutually agreed-upon event that triggers the passage of control. Once control is passed, the passing division exercises tactical control (TACON) over the in-place division until all of its forces are beyond the direct-fire range of the in-place division. During a rearward passage of lines, however, control is passed from the rearward-passing unit to the in-place division unit. Forces in the rearward-passing division become TACON to the in-place division once they are committed to the passage routes or corridors.

The division engineers must have a thorough understanding of when engineer functional and unit control is passed and the disposition of engineer forces and missions at the time of passage. When control is passed between the divisions, the corresponding DIVEN commander may assume TACON of all engineer forces of the passing or in-place division. The controlling DIVEN commander can then task engineers of the adjacent division based on immediate requirements during the passage. This is critical in the forward passage of lines, since it affords the passing DIVEN commander with a means of accomplishing unforeseen engineer tasks with minimal impact on engineer support to the subsequent attack.

Close coordination and joint planning between division engineers are critical to the success of the passage of lines. The division engineers of both the passing and the passed divisions collocate during the planning and execution of the passage of lines. They focus initially on exchanging information. This information includes individual obstacle locations and routes through the sector. It also includes the details of reserve target and situational-obstacle execution. The passing division engineer then ensures dissemination of the information to subordinates through coordination with the G3 and instructions in the division's OPORD, engineer annex, and overlays.

Whether conducting a forward or rearward passage, the in-place division has the responsibility to provide mobility for the passing unit along cleared routes or corridors through its sector. The in-place division engineer conducts a complete analysis of the passage-of-lines concept of operations. The in-place division normally tasks subordinate maneuver units to prepare the routes or corridors. The division engineer recommends a task organization of engineer forces to the maneuver brigades, based on the assets needed to clear assigned routes and corridors. Clearing operations must be completed prior to the initiation of the passage. Additionally, the in-place division engineer must plan the closure of lanes through obstacles, if required, once the passage is complete.

The passing division organizes for in-stride breaching operations prior to initiating the passage of lines. This is to ensure rapid support for mobility operations and the continuation of the passage in the event a route is shut down during the mission. Creating lanes through the in-place unit's obstacles requires permission from the division exercising TACON. Authority to reduce friendly

obstacles in response to an immediate tactical situation may be given to subordinate units. This authority is included in coordinating instructions. Under all circumstances, this action must be reported to the passed unit so that the obstacle can be repaired. The division engineers must closely monitor the passage during execution to advise the respective division commanders on the impact of such occurrences.

C2 of both the passed and passing unit engineers during the passage of lines also transfers to the division exercising TACON. The division engineer of the division with TACON must facilitate control of the engineer units during planning and execution of the passage by having an accurate status of all engineer assets, activities, and obstacle control measures in the sector. This includes the status of all reserve targets and situational obstacles, including the execution criteria for each.

LARGE-SCALE BREACHING OPERATIONS

A large-scale breaching operation is defined as a breaching operation conducted by brigades and divisions to create a penetration through well-prepared defenses and pass follow-on brigades or divisions. A large-scale breach is not a separate tactical operation but can be an inherent part of a division or corps offensive operation. By its nature, a large-scale breach requires increased division involvement in suppressing, obscuring, securing, and reducing the enemy's obstacles and defensive positions. The phases of a large-scale breach are–

- **Attack to the obstacle:** the buildup of division combat power at the point of penetration.
- **Breach and assault:** initial penetration of the enemy's defenses by the lead brigades.
- **Secure the beachhead:** clearing forces within the beachhead; securing the lodgment against counterattack.
- **Passage of follow-on forces:** forward passage of follow-on forces through the beachhead and battle handover.

The above phases of a large-scale breach are not separate and distinct from those of the maneuver plan. Instead, they are a framework for integrating large-scale breaching operations into the overall plan of attack. Elements of each phase are integrated into the phases of the scheme of maneuver.

The division engineer must understand how the conduct of a large-scale breach impacts on engineer missions, force allocation, and C2. With the increased, more active role of the division comes a corresponding increase in the role of the division engineer in planning and executing division-level engineer missions. Engineer support during the attack to the obstacle and breach and assault phases is the same as discussed in Chapter 3 for a division DATK. Likewise, the considerations to support a forward passage of lines discussed previously apply in planning for the passage of follow-on forces. However, there are also maneuver requirements unique to a large-scale breach that the division engineer must consider in developing a scheme of engineer operations.

The first maneuver requirement that drives special engineer planning is that of projecting large combat formations through a heavily obstacled area. This requires the division to establish a lane network quickly through the enemy's defense. The lane network must make maximum use of the achieved penetration and posture follow-on forces for continuing the attack. Whether the follow-on force is a subordinate brigade

or follow-on division, establishing the lane network is a division-level responsibility. In coordination with the G3, the division engineer must anticipate lane requirements, develop a tentative plan for the lane network, and allocate the necessary engineer forces. He bases his recommended force allocation on the number of lanes to be reduced and the number and length of routes to be improved or maintained through the breachhead. He closely monitors the breaching plans of the lead brigades. He must envision the end state of the breach and assault phase to determine how many lanes, in addition to those made by the breaching brigades, must be reduced by engineer follow-and-support forces. The number of lanes in the lane network must support simultaneous forward passage of combat forces as well as the sustainment traffic (two-way passage) for brigades securing the beachhead.

The engineer effort involved in establishing and synchronizing the lane network with the breaching efforts of the forward brigades may require central division-level functional and unit control of engineer forces. In this case, the DIVEN commander may control all engineer units committed to the lane effort on behalf of the division commander. This is a situation that will call for the deployment of the DIVEN TAC to provide the DIVEN commander with forward C2. The DIVEN TAC facilitates synchronization of the large-scale breaching operation by aggressively tracking the brigade fights through the division TAC CP and continuously cross talking with the division main CP and the DIVEN commander.

The second maneuver requirement that merits special engineer consideration is securing the beachhead from counterattack. Once the lead brigades have seized footholds within the enemy's defensive positions, forces committed on the far side of the obstacles become extremely vulnerable to counterattack. Furthermore, the lack of a developed lane network hampers mutual support of forward forces by brigade and division reserves. Therefore, the division engineer must consider the use of obstacles as a combat multiplier to assist in securing the beachhead line as well as the use of obstacle control measures to preserve the mobility of follow-on forces.

The division engineer plans for the use of obstacles by anticipating requirements and establishes obstacle zones that support hasty defenses, if necessary, but keeps passage corridors open for follow-on forces. Normally, obstacles supporting brigade hasty defenses are employed as situational obstacles triggered by enemy counterattack. To foster responsive obstacle support to brigade hasty defenses, the brigades must have the necessary assets and emplacement control. The division engineer uses the enemy situation and event templates to estimate the required resources and assess how responsive emplacement must be. Both are key factors in recommending the allocation of obstacle capability to maneuver brigades.

Obstacle location may be directed by either the division or the brigades. Where the avenues of approach are well-defined and enemy courses of action are limited, the division may decide to direct the location of obstacles executed by the brigades. This technique minimizes risk in executing obstacles that may affect future movement and aids in synchronizing division-level fires to cover the obstacle. However, the norm is to allow the brigades and battalions to decide actual obstacle locations based on their plans for a hasty defense. In this case, the division engineer ensures that the brigade obstacle plans support the division plan and do not conflict with the plans for the passage of follow-on forces or future division operations.

RIVER-CROSSING OPERATIONS

River-crossing operations generally fall into one of three categories: hasty, deliberate, and retrograde. The engineer planning considerations for each are generally the same, although some of the planning steps in a hasty crossing may be eliminated. FM 90-13 establishes the base doctrine, tactics, and techniques for planning, preparing, and conducting river-crossing operations.

A deliberate river crossing is an attack that is planned and carefully coordinated with all concerned elements based on thorough reconnaissance, evaluation of all intelligence and relative force rations, analysis of various courses of action, and other factors affecting the situation. It requires extensive planning, detailed preparation, and centralized control. A deliberate river crossing is expensive in terms of manpower, equipment, and supplies. It is generally conducted against a well-organized defense when a hasty river crossing is not possible or has been conducted and failed. This type of river crossing requires the sudden, violent concentration of combat power on a narrow front, in an area where there is a high probability of surprise.

Deliberate river-crossing operations consist of the following four phases: advance to the river, assault across the river, advance horn the exit bank, and secure the bridgehead line. These four phases are executed by the following three forces: bridgehead, support, and breakout. The division engineer uses the phases of a river crossing as a base framework for analyzing and identifying required engineer tasks and allocating forces. He then uses the forces of a river crossing as a basis for recommending a task organization of engineers within the division. Key division engineer considerations in planning and executing a deliberate river-crossing operation are–

- Establishing effective engineer C2 in the crossing area.
- Task organizing the appropriate mix of engineers for each of the river-crossing forces.

The division engineer recommends which unit should perform the crossing-force headquarters responsibility. The choices are the DIVEN headquarters or a corps engineer group headquarters. The division engineer's recommendation is based upon METT-T.

The division engineer recommends the optimum engineer task organization for engineers supporting the bridgehead, support, and breakout forces. He uses his EBA mission analysis as the basis for recommending engineer force allocation. He must identify any shortfalls and submit requests for additional assets to the G3, who requests them from corps.

Engineers supporting the bridgehead force must be capable of conducting in-stride breaching in order to sustain the momentum of the attack to seize and secure the lodgment, exit-bank, intermediate, and bridgehead objectives. Engineers must be capable of installing situational obstacles to block counterattacks against the bridgehead. Finally, engineers supporting the bridgehead force must be capable of maintaining and upgrading exit-bank routes to facilitate the rapid passage and force buildup of the breakout force.

Engineers task organized to assist the support force must be capable of bridging the river and assisting in traffic control. Corps engineers normally augment the division to do these tasks. Corps combat engineers may reconnoiter and develop crossing sites, operate assault boats, man engineer regulating points, and assist in controlling traffic and marking routes within the crossing area. Corps bridge units build and operate heavy rafts and assault float bridges.

A retrograde crossing is a movement to the rear across a water obstacle while in contact with the enemy. Retrograde crossings are planned in the same detail as deliberate crossings. The division engineer plans to support both the mobility requirements of the portion of the force conducting the river crossing and the mobility, countermobility, and survivability requirements of the portion of the force left in contact with the enemy.

The division engineer ensures that uncommitted engineers are on order to execute mobility tasks to clear scatterable munitions, clear road blockages, or construct bypasses to shift traffic movement from one crossing site to another. He is responsible for all engineer functions within the bridgehead, crossing area, and division rear.

CHAPTER 6

Combat Service Support

Sustainment is a critical element of combat power on the AirLand battlefield. Generating combat power requires the conversion of a force's potential, resources, and tactical opportunity into actual capability. Sustainment must support violent and coordinated action, allowing the division to concentrate at the decisive time and place. The ability to provide and sustain support for combat operations is predicated on thorough,integrated planning. Therefore, an inseparable relationship exists between operations, tactics, and sustainment during AirLand Battle operations.

The basic mission of CSS is to sustain the battle. The CSS system's sole purpose is to maintain and support our soldiers and their weapons systems. CSS operations must focus on sustaining the force as it executes the commander's intent while conducting deep, close, and rear operations. The measurement of sustainment success is the generation of combat power at the right place and time. CSS planners and executors must integrate with the planners for all organizations in order to provide the commander with the combat power to accomplish his mission. Sustainment planning must keep pace with the combat unit's rapid decision cycle. Sustainment execution must rapidly and thoroughly support current and future operations.

This chapter focuses on the role of the division engineer and staff in the sustainment of combat engineer units supporting division operations. It supplements CSS doctrine contained in FM 100-10, the Army's keystone manual for the CSS of combat and CS forces.

Sustaining combat engineer units is a complex mission that presents a unique challenge to the DIVEN headquarters. The special equipment needed to accomplish engineer missions requires intensive management of maintenance assets and supplies to support low-density engineer vehicles and special mobility and countermobility systems. Acquisition support and extensive transportation assets are often needed to obtain and move the materials necessary to accomplish engineer missions to the mmission site. The lack of sufficient CSS assets organic to the division engineer organization requires coordinated linkage with the supported unit's sustainment structure. The dispersion of engineer units throughout the battlefield places a distinct need to streamline C2 while retaining effective engineer unit status reporting. The necessity to task organize for missions, shift assets to support the changing situation, and re-task organize in response to maneuver plans, while always maintaining continuous support, requires close adherence to the sustainment imperatives.

Meeting these challenges requires engineer sustainment planners and executors to have a clear understanding of tactical and sustainment doctrine and the division's SOPs. It also requires engineer planners to integrate completely into the division's C2 process. A thorough understanding of the engineer C2 structure, as outlined in Chapter 2, is essential to planning and executing engineer sustainment successfully.

SUSTAINMENT IMPERATIVES

Sustainment planners and executors assist the commander in making the best use of available resources by following sustainment imperatives. These imperatives apply as much to engineer unit operations as to any other operations. Engineer commanders and their staffs must understand and use them while planning engineer operations.

Anticipation

Sustainment planners accurately forecast future requirements and accumulate the assets needed to accommodate likely contingencies. Engineer operations feature high fuel-consumption rates, repair parts, construction and obstacle materials, mines, and explosives. They require a large commitment of maintenance and transportation services. Engineer operations require finance services to support the local purchase of materials and services. Planners must anticipate personnel losses, critical replacement requirements, and necessary health services support. Because forward engineer units will likely depend on the CSS system of their supported unit, engineer planners must anticipate changes in task organization that redirect the flow of engineer sustainment.

Integration

Tactical plans must have fully integrated CSS. This is crucial for the engineer contribution to the overall plan since material, personnel, and services must be available at the right time and place for engineers to properly execute their missions. Integration tasks include the CSS needed to sustain both engineer units and their missions.

Continuity

Committed forces must receive continuous replacements, supplies, and services to maintain their fighting strength. Engineer units are always committed to either the current battle or preparation for the next battle. They need a constant flow of supplies and services to remain effective and productive. Maneuver units often rely on lulls in the tempo of an operation to conduct CSS operations. Engineers are not routinely afforded the same opportunity since many logistics-intensive mobility, countermobility, and survivability missions occur during lulls in the operation. This increases the engineer sustainment planner's responsibility to integrate continuous routine and emergency CSS operations into the tactical plan.

Responsiveness

The sustainment system must keep pace with rapid decision cycles and mission execution and react rapidly to crises or opportunities. The sustainment system must respond to the changing situation and the shifting of engineer units around the battlefield. Engineer sustainment planners must be particularly conscious of engineer task organization changes. When such changes occur, sustainment assets must be rapidly redirected to the receiving unit, making maximum use of the established division CSS structure. Since a unit can normally respond to re-task organization much quicker than its support can, interim contingency sustainment plans to support the re-task organized units must be developed.

Improvisation

CSS organizations must improvise to meet current needs and respond to unforeseen emergencies. Their success greatly influences the extent to which engineers must also improvise.

The sustainment system must support engineer operations in two ways. It must provide the support that engineer units need

to exist (unit sustainment), and it must provide the mission-specific materials and transportation engineers needed to accomplish their battlefield missions (mission sustainment).

CSS TASKS

Simply stated, CSS tasks are to man, arm, fuel, fix, and move the force. These tasks are generally categorized into logistics support, personnel service support, and health services support.

Logistics support includes–

- Supply.
- Transportation.
- Maintenance.
- Field services.

Personnel service support includes functions that provide soldiers to the command as well as contribute to their welfare and morale. Major personnel service support functions are–

- Personnel and administration services, including strength and personnel accounting, casualty reporting, replacement operations, awards, and personnel management.
- Chaplain operations.
- Enemy prisoner of war (EPW) operations.

Health services support includes–

- Medical treatment and evacuation of casualties.
- Preventive medicine.
- Medical supply operations.

Engineer sustainment planners and executors must focus on several essential areas to accomplish these tasks successfully. First, the engineer CSS planner must keep pace with the division's decision cycle through early, complete, and continuous integration into the division's C2 and CSS structure. They must be able to plan and adjust engineer sustainment in concert with the rapid division planning process. Second, tracking both subordinate and supporting engineer units' sustainment postures allows the sustainment planner to account for available resources, shift them as necessary, and integrate them into planning future operations. Third, detailed coordination with the division's CSS units allows engineer sustainment planners to influence current and future operations by ensuring that continuous and responsive CSS is maintained.

DIVISION ENGINEER CSS CONCEPT

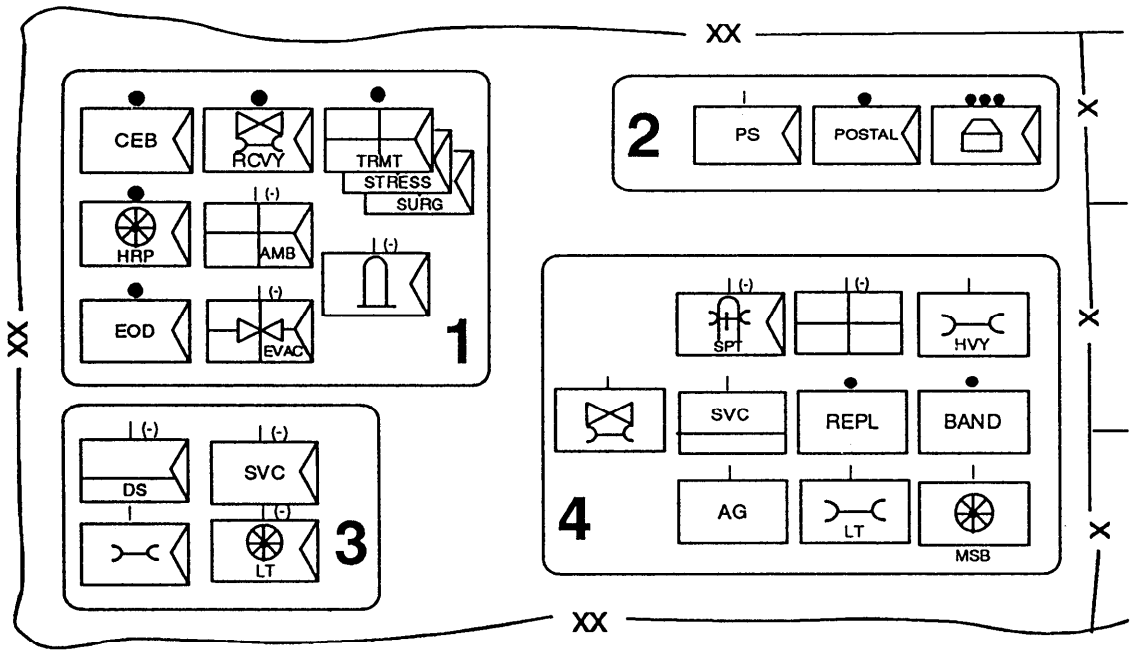
This section addresses the CSS concept for both mechanized and light division engineer units unless otherwise specified.

The DISCOM provides division-level logistics support and health services support to organic and attached units of the division through its main and forward support battalions. However, nondivision units operating in the division area may receive their logistics support from corps logistics units operating in and immediately rear of the division. Health services support requirements for nondivision units are absorbed into the existing division medical support structure which is augmented by corps medical units.

Personnel service support for the division is managed by the Assistant Chief of Staff, G1 (Personnel) (G1)/Adjutant General (AG) and supported by a DS corps personnel services company (PSC). Additional PSCs may augment nondivisional units that support a division, depending upon the unit size, or personnel service support may be absorbed by the DS PSC.

While the DISCOM commander is the principal logistics executor within the division, the division's G4 has coordinating staff responsibility for CSS planning and establishing policies and priorities. Together, they ensure adequate and continuous support for division units. Support for nondivision units is provided by the corps support group that works both in and to the rear of the division sector. Integration of nondivision units into the division CSS structure is conducted through the DISCOM and the corps support group's liaison officer (LNO), normally located in the DISCOM CP.

The DISCOM's main support battalion (MSB) provides logistics support and health services support to division units located in the division rear. Figure 6-1 shows an organization by area schematic of division and corps CSS units located in the DSA. The DISCOM MSB also augments the forward



1 COSCOM units that provide support to division & corps units.

2 Corps CSS units that provide support to division & corps units.

3 COSCOM units that provide support to corps units operating in division area.

4 Division CSS units provide support to division units.
NOTE: Medical company provides support to either division or corps on an area basis.

Figure 6-1. CSS organizations in the division rear

support battalion (FSBs). The FSBs provide logistics support and health services support to the units located in maneuver brigade areas.

Engineer CSS Laydown

Logistics support, health services support, and personnel service support for engineer units supporting a division will depend upon their location on the battlefield and their command support relationship to the supsupported unit. In terms of planning and integration, engineer units fall into three types:

- Engineer units in support of maneuver brigades in close operations.
- Engineer units supporting the division rear operations.
- The division engineer's HHD (mechanized) and HHC (light).

The division engineer's HHD (mechanized), like a maneuver brigade, has no organic capability to sustain its subordinate units. Therefore, division engineer units must rely on division CSS assets for sustainment. The DISCOM has the capability to tailor sustainment support for the close fight through its FSBs that directly support maneuver brigades.

The division engineer's HHC (light) has the organic capability to provide limited CSS to its subordinate units. Division light engineer battalion field trains operations will be discussed later in this chapter.

Division engineer units supporting maneuver brigades in close operations receive their logistics support and health services support from FSBs located in the BSA. Personnel service support, minus promotions and transfers, is obtained through direct coordination between the division engineer battalion Adjutant (US Army) (S1) and the maneuver brigade S1.

The FSBs, augmented by corps CSS assets, provide logistics support and health services support to nondivision engineer units supporting maneuver brigades in close operations. Special support packages from the corps support group are tailored and sent to the BSA to support nondivision units that support maneuver brigades through direct coordination with the corps support group LNO collocated with the DISCOM CP. Personnel service support remains with corps personnel units that locate in the DSA.

The DS corps support battalion provides logistics support and health services support to nondivision units supporting operations in the division rear area. Personnel service support is obtained through the direct coordination with corps personnel units in the DSA.

The division engineer CPs normally locate close to the division's CPs and receive support in conjunction with their respective division CP. Division CPs receive their logistics, personnel service, and health services support from the MSB through the division HHC. When a consolidated division engineer CP is established, the HHD (mechanized) must still receive its support by working through the division HHC and the MSB. When a consolidated division engineer CP is established, the HHC (light) is capable of self-sustainment through the MSB.

Regardless of the command or support relationship and location on the battlefield, all engineer units operating in the division's area must provide routine CSS status reports through the appropriate headquarters to ensure that the CSS of engineer units and missions is fully integrated into the division's planning and coordination of sustainment support.

Flow of Support

CSS for engineer units supporting a division is divided in two basic categories, unit sustainment and mission sustainment. Unit sustainment encompasses all of a unit's CSS

requirements needed to remain a viable fighting force. Mission sustainment consists of the supplies needed to accomplish specific engineer missions for the division. The flow of supplies and services in these categories differs and must be understood by engineer CSS planners and executors. Figures 6-2 and 6-3 and Figure 6-4, page 6-8, show the flow of supplies for unit and mission sustainment. The requisition and delivery processes vary, based on the class of supply or type of service. Unit sustainment, however, is generally accomplished through the DISCOM infrastructure to service forward engineer units. Division engineer units (regardless of their location in the division area) and corps engineer units supporting the close fight requisition and receive support through the division's DISCOM. Supply and services for nondivision engineer units working in the division rear area are normally requisitioned through the corps support battalions and corps personnel units supporting them. Mission sustainment requires supplies, such as Class IV/V, that are used to install or breach obstacles both in the offense and defense. These supplies are requisitioned through the DISCOM for both division and non-division engineer units. These supplies are normally moved from corps supply and ammunition companies by corps trucks as close to the

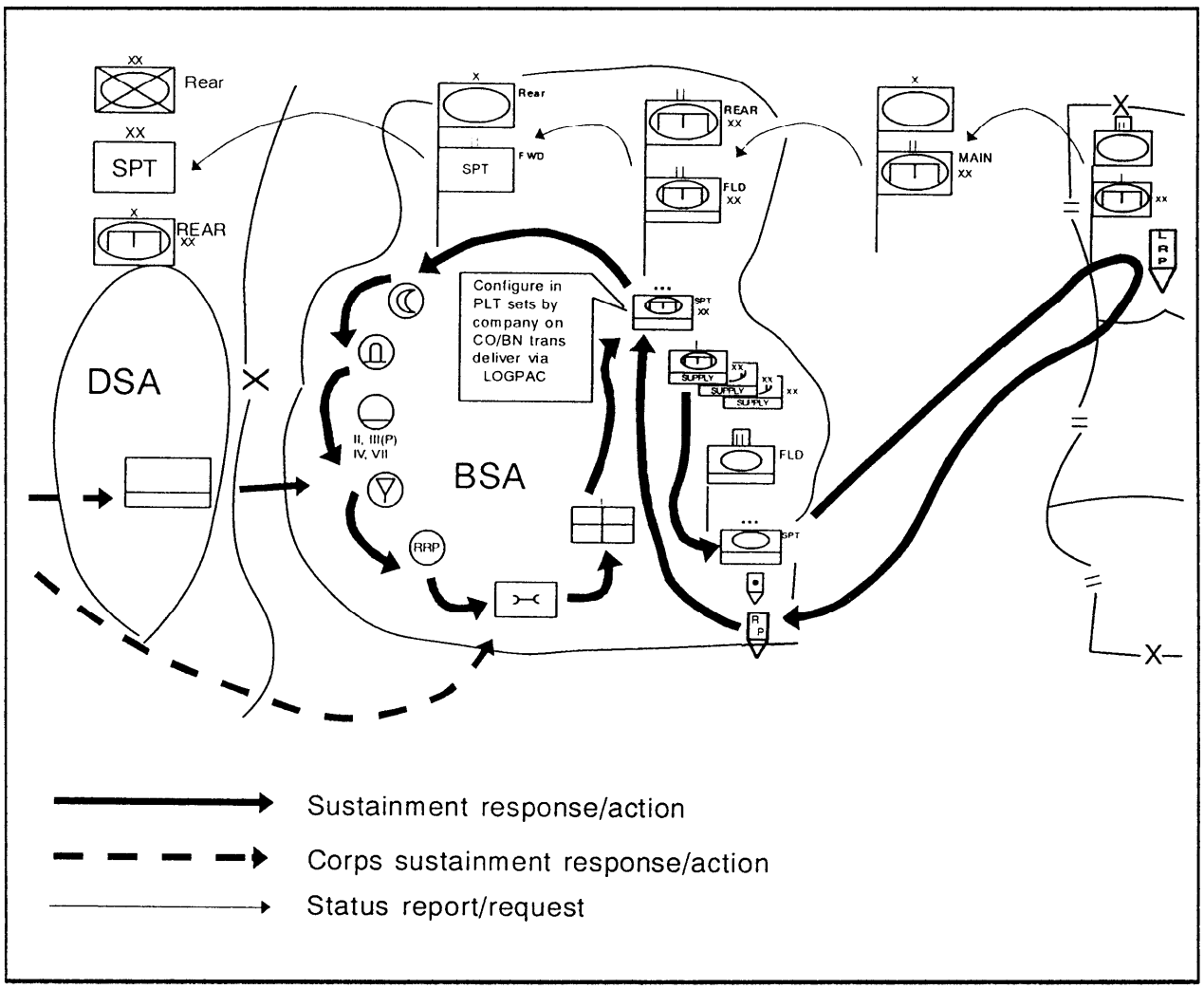


Figure 6-2. Unit sustainment for mechanized division engineers

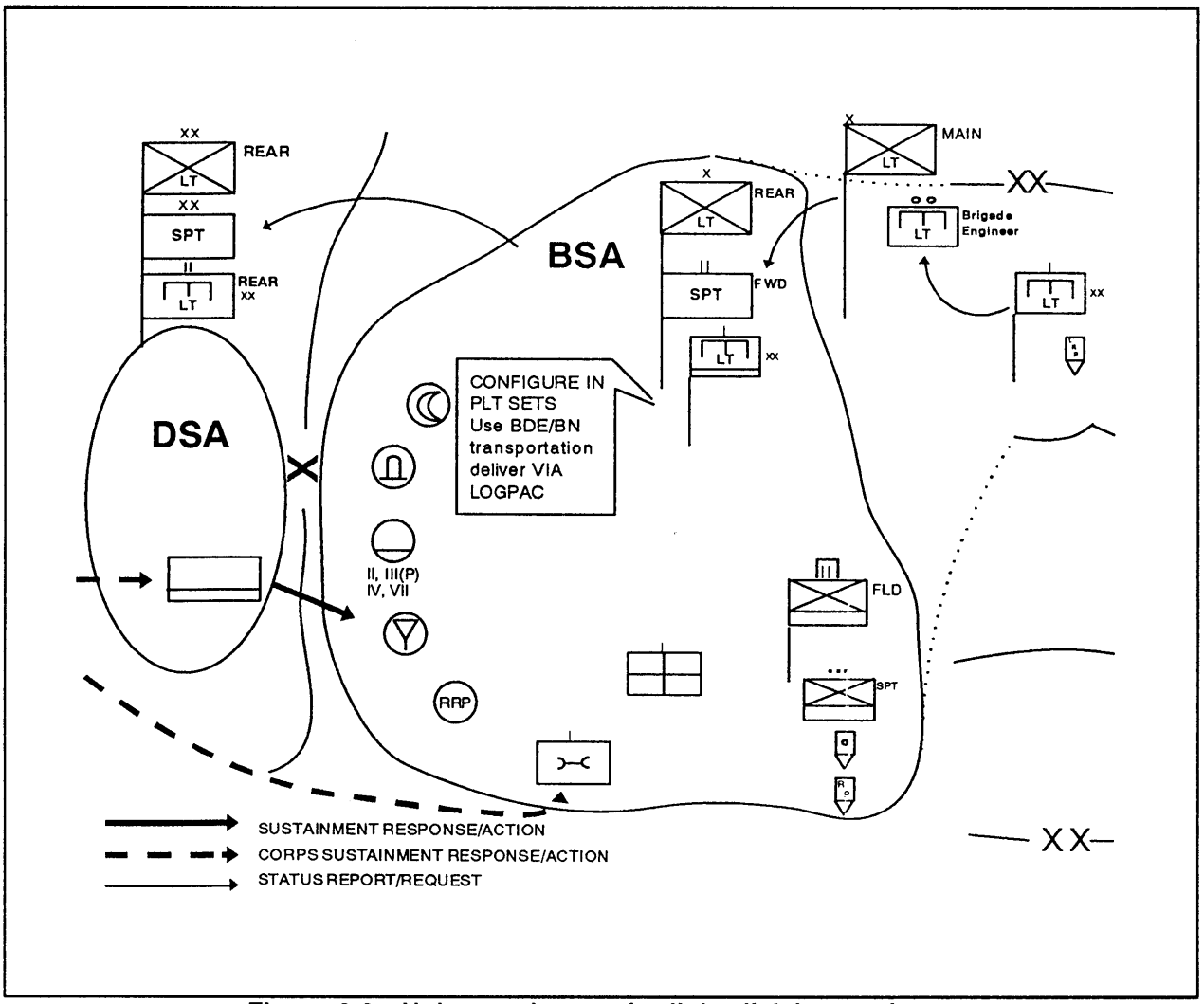


Figure 6-3. Unit sustainment for light division engineers

obstacle locations as possible. This minimizes multiple material handling requirements, reduces the transportation requirements on division transportation assets, and facilitates a faster emplacement of the obstacles. If mission-required supplies cannot be delivered directly to the obstacle locations or engineer unit by corps transportation assets, a plan using division and task force transportation assets is required. Engineer units are equipped to augment this operation with limited transportation assets but are not responsible for planning, controlling, and executing the delivery of mission-required material.

Division engineers can influence both unit and mission sustainment requirements through early integration into the sustainment planning process at the main and rear CPs. Sound sustainment estimates, accurate tracking of engineer unit sustainment posture, and continuous coordination with the DISCOM to ensure that requirements for engineer units are properly forecasted, prioritized, and delivered will assist engineer units in accomplishing their mission. Crucial to accomplishing these tasks are the responsibilities of the engineer organization's key CSS leaders and their functions within the division and engineer

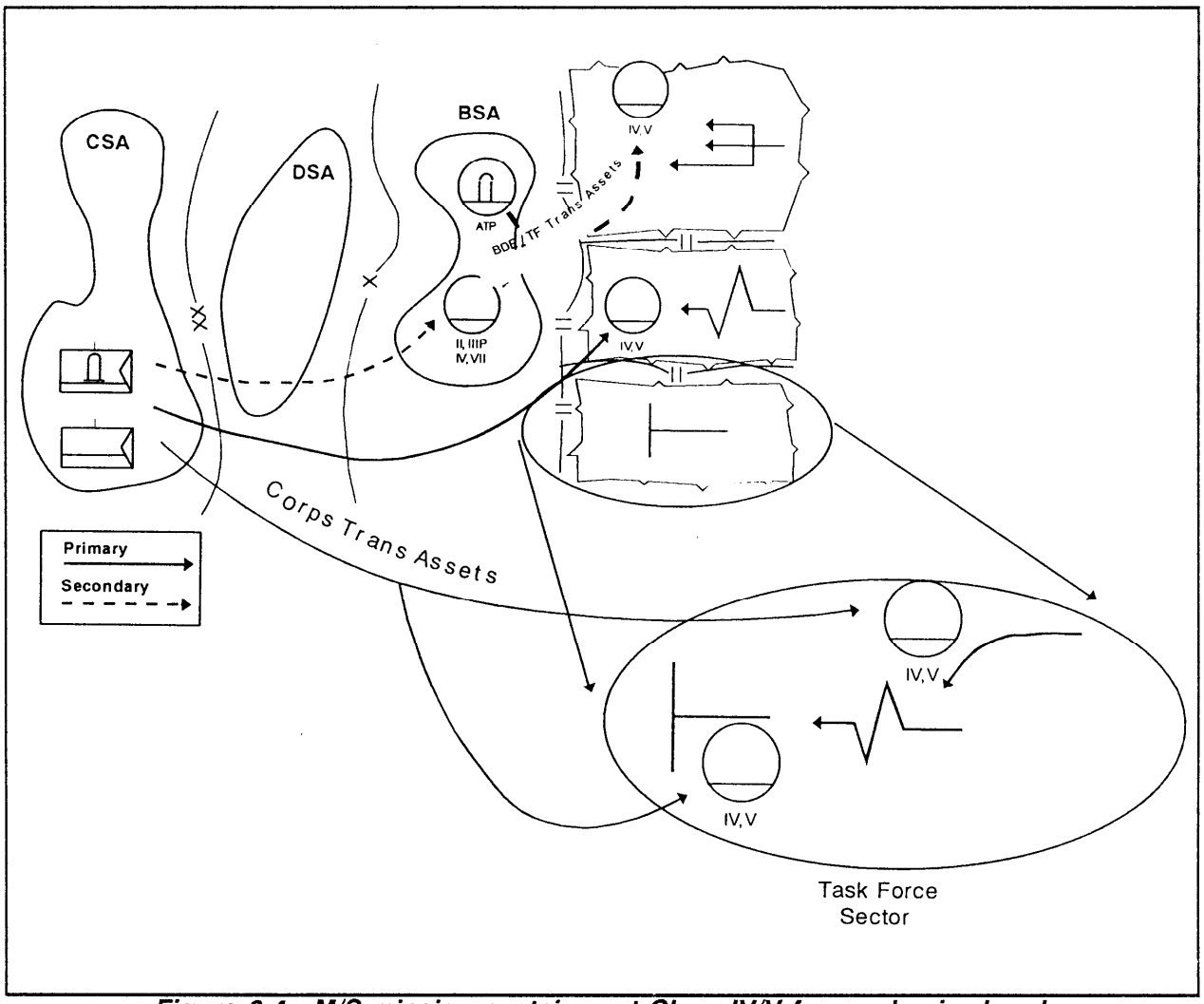


Figure 6-4. M/S mission sustainment Class IV/V for mechanized and light division engineers

CP systems. All engineer commanders and staffs supporting a division's fight must be familiar with and support these roles and functions in order to ensure appropriate unit and mission sustainment of the engineer force.

Key Engineer CSS Leaders

Executive Officer (XO). In addition to his second-in-command (2IC) duties, the XO is responsible for synchronizing all CSS operations in the engineer brigade. He is responsible for directing the execution of engineer staff CSS tasks, coordinating the effort of staff members, and supervising the efficient and prompt response of the staff CSS functions. He relies on the administration/logistics section (with representation in the engineer REAR and MAIN) to plan, integrate, request, and monitor engineer CSS functions that support both engineer unit sustainment and supplies and services needed to accomplish the division's engineer missions.

ADE. The ADE is responsible for writing and integrating engineer-specific information for inclusion in division orders, including CSS. The ADE ensures that essential

engineer CSS requirements are identified, coordinated, and published. The ADE is assisted in this task by the division rear CP engineer, the division engineer REAR, and the division engineer MAIN, as necessary.

Division Rear CP Engineer. The division rear CP engineer is responsible for identifying requirements and ensuring that logistics are coordinated for engineer units operating in the division area. The division rear CP engineer is assisted in this task as necessary by the division engineer REAR and MAIN CPs.

S1. The S1 is responsible for engineer integration with the division staff and CSS organizations for personnel service support and general administrative functions. The S1 must be cross trained with the Supply Officer (US Army (S4) in all areas of engineer sustainment.

The S1 ensures coordination with the G1/AG staff in the division rear CP and the division's supporting PSC in executing the personnel services and general administration functions.

S4. The S4 is responsible for engineer integration with the G4 staff in the division rear CP and the collocated DISCOM CP in the DSA in order to plan, coordinate, and monitor logistics operations for organic engineer units that remain under division control. He provides detailed sustainment input to division engineer MAIN for orders development for each mission. The S4 closely monitors and accurately tracks the sustainment status and requirements of forward engineer battalions through the division engineer MAIN and engineer units working in the division rear through his own CP. He is assisted by a chief supply sergeant and supply specialists for supply-related functions. He is also assisted by the maintenance technician warrant officer and senior maintenance supervisor for troubleshooting maintenance operations and support. The S4 should be fully cross trained in S1 operations in order to provide assistance and supervision to the personnel services noncommissioned officer (PSNCO) in the absence of the S1.

HHD Commander. The division engineer HHD commander commands the HHD CP and is assisted by the HHD detachment sergeant. The commander is responsible for coordinating sustainment of the division engineer CPs and the division engineer command group. He ensures coordination and integration with the division HHC and MSB by providing the requirements necessary to support these elements, tracking their sustainment status, and responding to their problems. The HHD commander may be required to perform staff functions in the division engineer REAR, underscoring the importance of the detachment sergeant as the assistant HHD CP commander and coordinator of the sustainment plan to support the dispersed DIVEN HHD.

Division Light Engineer Battalion HHC Commander. The division light engineer battalion HHC commander commands the engineer battalion field trains. He is responsible for the sustainment of all division light engineer battalion organizations operating in the division rear area. Additionally, he coordinates the support of the battalion A&O platoon assets supporting the close fight.

Key Engineer CSS Headquarters

Division engineer CSS C2 for the division centers around the DIVEN MAIN and REAR but pervades all engineer C2 nodes. Each engineer CP has specific responsibilities in identifying requirements, estimating resources, integrating into the division's planning and decision cycle, and monitoring the execution of engineer sustainment missions.

DIVEN REAR. The DIVEN REAR is the DIVEN headquarters' primary integrator into the execution of CSS for the DIVEN commander's subordinate units. The DIVEN

REAR also supports the division rear CP engineer as he integrates engineer CSS with the division. The rear CP engineer coordinates sustainment for current operations and plans and prepares for implementation of future operations. The DIVEN REAR's sustainment missions consist of responsibility for maintaining updated CSS status of engineer units, providing the DIVEN MAIN detailed CSS estimates to assist in formulating division plans and orders, and ensuring that engineer sustainment plans for both division and nondivision engineer units are synchronized with the DISCOM.

DIVEN MAIN. The DIVEN MAIN supports the ADE in the division main CP. The DIVEN MAIN assists the ADE in developing the engineer sustainment plan and writing the engineer CSS portions of the basic division OPLAN or OPORD and paragraph 4 of the engineer annex. The ADE integrates engineer sustainment into division operations through coordination with the CSS cell in the division tactical operations center (DTOC), the part of the DIVEN MAIN CP that runs the battle and coordinates CS and CSS. The DIVEN MAIN or ADE ensures that immediate sustainment requests received from the DIVEN TAC or division TAC CP are forwarded to the DIVEN REAR or division rear CP for execution.

DIVEN TAC. The DIVEN TAC has limited capability to impact CSS operations from this location. Its primary CSS duties are supporting the division TAC CP engineer and receiving and forwarding reports and influencing the redirection of sustainment priorities for the forward engineer battalions.

DIVEN HHD CP. The DIVEN HHD establishes a CP at or in close proximity to the DIVEN REAR. The HHD CP is responsible for the sustainment of the HHD. This includes coordinating sustainment support for all DIVEN CPs and the DIVEN command group. From the HHD CP, the administrative and logistics section conducts close coordination with the DIVEN REAR to monitor the status of replacements, maintenance, and requisitions for supplies and services that support the engineer units commanded by the DIVEN commander.

Division Engineer Role in Planning and Coordinating CSS

The DIVEN organization's efforts to plan and coordinate engineer CSS are essential to full integration of engineer units into the division's sustainment structure. The ADE (assisted by the DIVEN MAIN), the division rear CP engineer (assisted by the DIVEN REAR), the DISCOM, and the G4 work closely to synchronize the planning and coordination process and facilitate sound and timely plans or orders and sustainment for engineer units.

Upon receipt of the WARNORD for a mission, the division rear CP engineer, assisted by the DIVEN REAR, immediately initiates the CSS estimate process as outlined in FM 101-10-1/2. These estimates are specifically focused on the sustainment of all subordinate engineer units organic or attached to the division. Class I, III, IV, and V supplies and personnel losses are the essential elements in the estimate process. Close integration with the DISCOM can simplify and speed this process through the use of their automated data processing (ADP) systems. During continuous operations, the estimate process may need to be abbreviated due to time constraints. Aggressively maintaining an accurate combat status of all engineer units is critical to shortening the CSS estimate process.

Having conducted the estimate process to determine the unit sustainment and mission supplies requirements, the division rear CP engineer compares the requirements with the reported status of subordinate units to determine specific amounts of supplies needed to support the operation. These requirements are then coordinated with the DISCOM to ensure that necessary supplies

are identified and resourced through division or corps stocks.

Simultaneously, the ADE, assisted by the DIVEN MAIN, develops a required supply rate (RSR) to support engineer mission requirements and forwards it to the division rear CP engineer. Based on the division's current stockage of required items and the identification of additional supplies needed, the division rear CP engineer, in coordination with the G4, assesses the availability of these supplies in corps stocks. The division rear CP engineer and G4 also analyze the division's capability to transport mission supplies to the user.

Having identified the requirements for both unit sustainment and engineer mission supplies and their availability, the requirements are forwarded to the ADE, along with a projected combat power status, based on current engineer sustainment operations. The ADE then analyzes the requirements to support the plan and translates them into specific plans that are used to determine the supportability of division courses of action. Upon determination of a course of action, the specific CSS input to the division's basic order and paragraph 4 of the engineer annex are developed and incorporate into the order. Current sustainment operations may require redirection based on the new plan and will be sent to the division rear CP engineer for coordination and execution. Figure 6-5 shows the CSS planning and coordination flow within the DIVEN CP system.

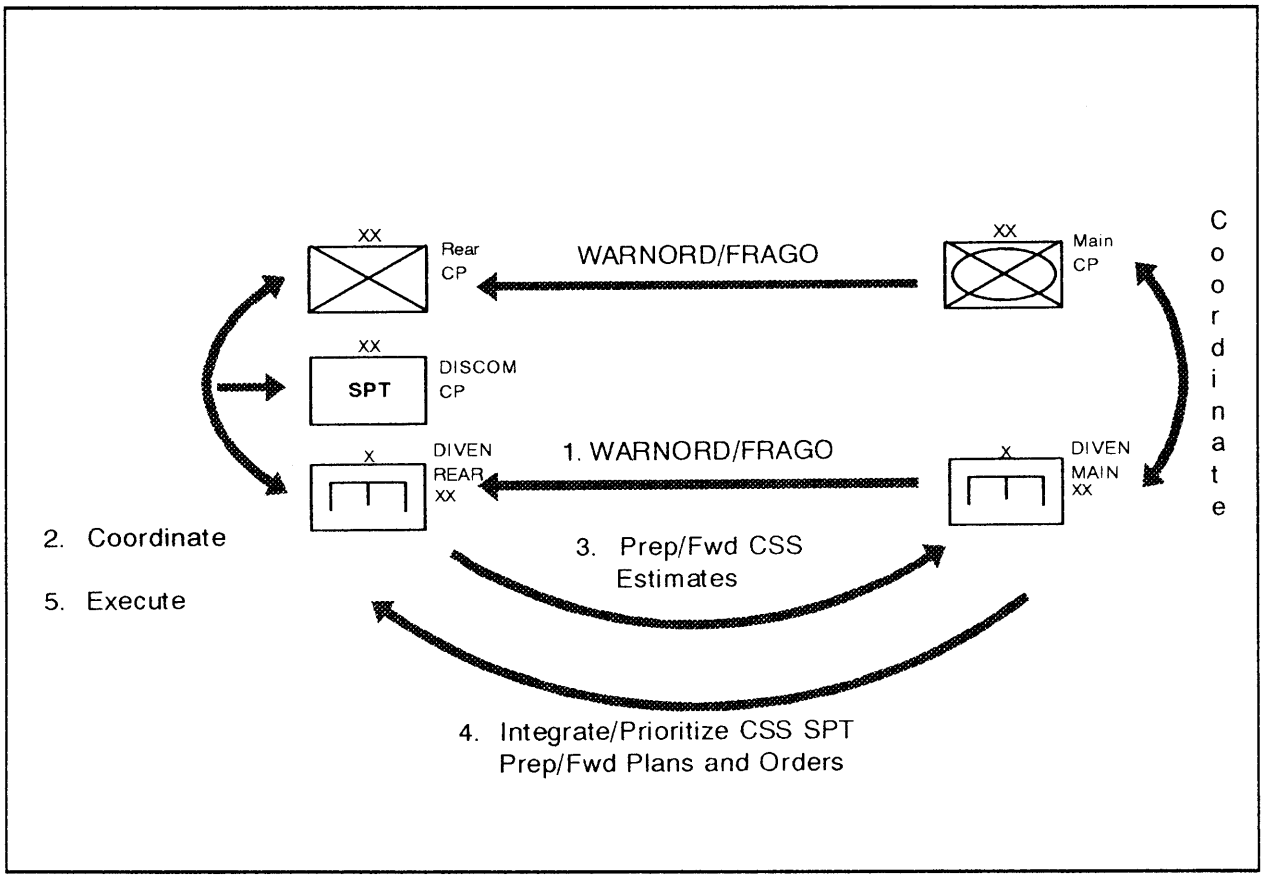


Figure 6-5. CSS planning and flow of information for mechanized and light division engineers

The DIVEN commander also has essential CSS tasks involving nondivision engineer units. First, the DIVEN headquarters monitors the sustainment status of nondivision engineer units. Nondivision engineer unit commanders and their staffs must support this requirement. Accurate and timely status reporting will assist the DIVEN commander in providing accurate engineer status to the division commander and energize the DIVEN staff support to intercede in critical sustainment problems where necessary. The DIVEN staff also ensures that mission-required supplies needed by nondivision engineer units to execute missions for the division are integrated into the division's CSS plans. Accurate and timely reporting and close coordination between the DIVEN staff and supporting nondivision engineers are essential for proper execution of the missions. The concept of the CSS planning and coordination process is essentially the same.

LIGHT FORCES

Light Division CSS Concept

Light and armored divisions have similar support structures to sustain their operations. The previous discussion of the armored division CSS concept and the flow of support is generally applicable to light divisions and their supporting engineers.

The major difference is that the light engineer battalion field trains play an active role in the sustainment of both HHC organizations and engineer battalion subordinate units operating in the division rear area.

Division Light Engineer Battalion Field Trains Operations

The division light engineer battalion field trains is configured to support the division light engineer battalion when operating as a complete unit or those subordinate units that operate in the division rear area. The field trains can also provide limited support packages to partially sustain subordinate units when they are task organized to maneuver brigades committed to the close fight. The field trains contains the following organizations:

- Company headquarters.
- Mess section.
- S1 and S4 sections.
- Communications section.
- Battalion maintenance section.
- Medical section.

Company Headquarters. The division light engineer battalion HHC headquarters commands and controls the battalion field trains through the field trains CP. The field trains CP is located in or as close as possible to the DIVEN REAR in the DSA. The primary function of the field trains is to ensure the sustainment of the engineer battalion during consolidated operations and HHC assets when the battalion is dispersed. It also provides a sustainment base for all battalion assets not deployed in the close fight.

Mess Section. The mess section operates under the control of the HHC in the battalion field trains when the majority of the division light engineer battalion operates together. When the division light engineer companies are task organized to maneuver brigades, the mess section may collocate with the division HHC mess section to assist in the support of the dispersed engineer CPs.

S1 Section. Elements of the S1 section operate in the battalion field trains and execute the battalion's personnel services and general administration. S1 personnel in the field trains CP perform the critical tasks of strength accounting and casualty reporting, replacement operations for all division light engineer battalion organizations in the division rear area, administrative services, personnel actions, and limited legal and finalcial services. They also support the HHC commander by performing CP functions.

S4 Section. Elements of the S4 section operate in the division light engineer battalion field trains and primarily focus on battalion supply functions. This includes direct coordination with DISCOM and the MSB to ensure the flow of critical mission supplies to the forward division engineer companies through the FSBs. Additionally, they support the HHC commander in general CP duties.

Communications Section. The communications section supports the division light engineer battalion subordinate units operating in the division rear area with organizational maintenance. They are responsible for the evacuation of communications assets to DS level maintenance. They also provide assistance to the field trains CP for general CP duties as required.

Maintenance Section. The maintenance section supports the division light engineer battalion with organizational maintenance. It provides maintenance contact teams to support the A&O platoon when it operates in support of the close fight.

Medical Section. The medical section is task organized to provide medical support to division light engineer companies by providing a combat medic to each combat platoon. The senior medic provides combat medic support to the field trains CP.

Division Light Engineer Battalion Field Trains Functions. The division light engineer battalion field trains have the following major functions:

- Establishing and maintaining the field trains CP.
- Coordinating support for the DIVEN CPs.
- Sustaining division light engineer companies operating in the division rear area.
- Supporting the A&O platoon during rear operations and coordinating support during forward operations.
- Self-sustainment.

Sustainment of the DIVEN CPs and the DIVEN command group is coordinated and executed by the field trains CP. The HHC commander ensures integration with the main support battalion through the division HHC by providing the sustainment requirements necessary to support the DIVEN CPs and command group, tracking their sustainment status, and responding to their problems.

The field trains support division light engineer companies with unit sustainment requirements when they are conducting rear operations and not yet task organized with a maneuver brigade. A logistical package (LOGPAC) system is executed using internal battalion assets, drawing the necessary supplies from the MSB. DS maintenance and health services support are obtained through direct coordination between the field trains and the MSB.

The field trains provide unit sustainment for the A&O platoon when they conduct rear operations. The HHC conducts a company LOGPAC drawn from the MSB. Since the HHC has limited fuel-hauling capacity, special coordination must be made for direct delivery by MSB assets or tying in with the fueling plan of the unit they support. Organizational maintenance contact teams are organized to support the maintenance effort

of the A&O platoon equipment. DS maintenance and health services support are obtained through the MSB's maintenance and medical companies.

The field trains CP coordinates the A&O platoon's sustainment when they are task organized to support maneuver brigades in the close fight. This is done through the DIVEN REAR or the engineer unit supporting the maneuver brigade. If no other engineer unit is supporting a maneuver brigade, coordination is made through the DIVEN REAR with the maneuver brigade's supporting FSB. The brigade engineer can assist, when needed, to influence this relationship. The MSB is capable of sending an engineer maintenance team to the FSBs to sustain engineer equipment supporting the close fight. Health services support must be coordinated through the closest unit.

The field trains must also be self-sustaining. The HHC first sergeant (lSG), assisted by the supply noncommissioned officer (NCO), plans and executes the sustainment of the HHC. Class I supplies are obtained through the battalion mess section. Other normal unit sustainment needs are fulfilled by routine supply runs to the MSB.

Chapter 7

Contingency Operations

Contingency operations are military actions requiring rapid deployment of the full spectrum of military forces in support of national policy short of war. These operations are normally undertaken when vital national interests are at stake and when direct and indirect diplomacy or other forms of influence have been exhausted or need to be supplemented by either a show of force or a direct military action. The ability to respond to these crises will be based on two factors: the judicious forward presence of US military forces and the strategic response from continental United States (CONUS)-based forces.

US divisions may be required to respond rapidly to a variety of contingencies anywhere in the world. The division may deploy to conduct operations where there may or may not be any existing US or allied presence. Conflicts in these areas may be at any level of intensity and are characterized by little or no predeployment warning to the assault force. Upon arrival in the theater, the division will normally become part of a larger force, commonly the corps to which it is assigned or a JTF.

Because of their rapid deployability, the airborne, air assault, and light infantry divisions are uniquely qualified in reacting and conducting contingency operations. Armored forces, also an important element to contingency operations, are usually task organized into the force packages based on METT-T, unless they are already forward deployed close to the contingency area. Armored divisions require the dedication of substantial amounts of sea, ground, and airlift assets, and routinely follow a light force into the AO at a later date.

Division and corps engineer forces provide critical support to contingency operations. To provide this support, the division engineer must understand the characteristics, mission types, and doctrinal fundamentals of contingency operations. Regardless of the type of division, he must appreciate how these factors apply to engineer missions and how engineer missions and forces are integrated into contingency operations. The engineer estimate process is the principal planning tool for the division engineer to integrate with division contingency operations planning.

Contingency operations such as Urgent Fury, Golden Pheasant, Just Cause, Desert Shield/Storm, and Restore Hope clearly illustrate how contingency operations require the full spectrum of engineer forces. The challenge facing engineer force planners at all levels is to maximize the combat potential of the force, balanced against the many uncertainties of a rapidly developing operation. Planners meet this challenge by synchronized, coordinated, and detailed planning.

CHARACTERISTICS AND TYPES OF CONTINGENCY OPERATIONS

The division engineer must understand the characteristics and importance of contingency operations as outlined in FM 100-15. While there is a variety of contingency operations, the focus of this chapter is on contingency operations which involve combat operations, such as strikes and raids. FM 5-114 provides additional information on engineer support to contingency operations in peacetime and during conflict. Characteristics of contingency operations are–

- US interests are at stake.
- Crisis generated.
- Time sensitive.
- Political pressure for a quick, clear victory.
- Uncertainty of the situation on the ground.
- Joint and combined operations.
- Political situation may impose a degree of centralized control.
- Forces may be constrained by sea and airlift.

There are nine major types of contingency operations:

- Show of force and demonstration.
- Noncombatant evacuation operations.
- Rescue and recovery operations.
- Strikes and raids.
- Peacemaking.
- Unconventional warfare.
- Disaster relief.
- Security assistance surges.
- Support to US civil authorities.

The versatility of the division presents war planners with multiple employment options for responding to the variety of contingencies. The selection of the preferred option or a combination of options is based on consideration of METT-T and guidance from corps. This option, once selected, becomes the planning, execution, and synchronization framework for the operation. Division employment options are discussed in FM 71-100. The corresponding division engineer employment options include–

- Employing the division engineers as organized.
- Augmenting and task organizing the division engineers after deployment. Division engineers normally require augmentation from division or echelons above division (EAD) engineer elements to increase their capability to support the mission.
- Augmenting and task organizing the division engineers before deployment. Division engineers are augmented with EAD engineer elements before deployment due to the lack of forward-deployed engineer forces or to meet operation-specific requirements.
- Designating selected items of pre-positioned equipment in the theater for issue or procurement for division engineers.

Any of the options selected must support a combined arms force organized into three echelons: assault, follow-on, and rear. The

division commander designs his forces around METT-T, ensuring that it allows the deployment and proper employment of each echelon. The division engineer conducts parallel planning with the division staff to develop a corresponding echeloned engineer task organization that supports the echeloned division forces. To do this, he sequences related engineer activities with the maneuver plan. These activities and related functional and unit duties and responsibilities should be laid out in the division, DIVEN headquarters, and division engineer battalion readiness SOPs.

During planning, the division engineer has two overriding goals: maximizing the combat capability of the division and reducing support requirements to essentials. While the division engineer uses METT-T analysis to determine the exact mix of engineer forces in each echelon, the influence of these two goals on planning is extremely crucial. Contingency operations are characterized by uncertain and rapidly changing situations, coupled with the operations's unknown duration. Engineer planners must be able to evaluate the possibilities and support the maneuver commander in overcoming them while allowing him to adapt and remain proactive during the entire operation.

The following sections of this chapter will use the five phases of contingency operations and a CONUS-based force as a vehicle to address division engineer planning considerations and functions.

CONTINGENCY OPERATIONS PHASES

There are five phases to contingency operations:

1. Predeployment and crisis action.
2. Deployment and initial combat actions.
3. Force buildup and combat operations.
4. Decisive combat operations.
5. Redeployment.

These phases provide the basic planning and execution structure and can be adjusted or modified to fit the needs of any particular contingency operation.

FM 71-100 outlines division planning considerations for all phases of a contingency operation. The engineer estimate provides the planning framework for the division engineer to integrate into the division's command estimate process for contingency operations planning. It provides a systematic procedure for developing the engineer task organization and scheme of engineer operations to support all phases of the contingency operation.

Predeployment and Crisis Action

At the onset of the predeployment and crisis action phase, alert notification is made to the division, brigade, and lower levels. Division personnel are assembled and moved to marshaling areas where final unit deployment preparations are made. Mission analysis is also initiated, as well as the development of tactical concepts and required force structures, to accomplish the mission. Figure 7-1, page 7-4, shows an example of a phase 1 analysis by a CONUS-based contingency force. A similar analysis is also conducted by a forward-deployed contingency force.

This is the critical phase of a contingency operation. Success during the other phases is predicated on the successful planning conducted during this phase. The division commander and his staff must anticipate

the requisite military conditions for success, sequence activities that will achieve those conditions, and resource accordingly. They must synchronize and sequence activities that rapidly transition the division into the deployment and initial combat phase.

The division engineer conducts a detailed engineer estimate during this initial phase to develop the engineer force allocation and support for each phase of the contingency operation. Figure 7-2 shows an example of engineer functions for this phase. The division engineer begins the engineer estimate by analyzing initial mission guidance and information contained in the corps or JTF OPLAN and OPORD. Based on the identified missions, the division engineer supports the division's development of facts and assumptions. Engineer integration into the IPB is vital during this phase. The division engineer conducts the EBA to provide the G2 with the critical aspects of terrain and enemy engineer activity which impact on the maneuver plan. The division engineer works closely with the topographic terrain team to analyze ports, airfields, and other aspects of terrain. At this point, the division engineer normally has extensive information requirements, which stem from the uncertainties of the area of operations. His involvement in the IPB ensures that engineer - specific PIRs, IRs, and NAIs are incorporated into the collection plan and used in the four principal templates. These are developed to support all three echelons of the division

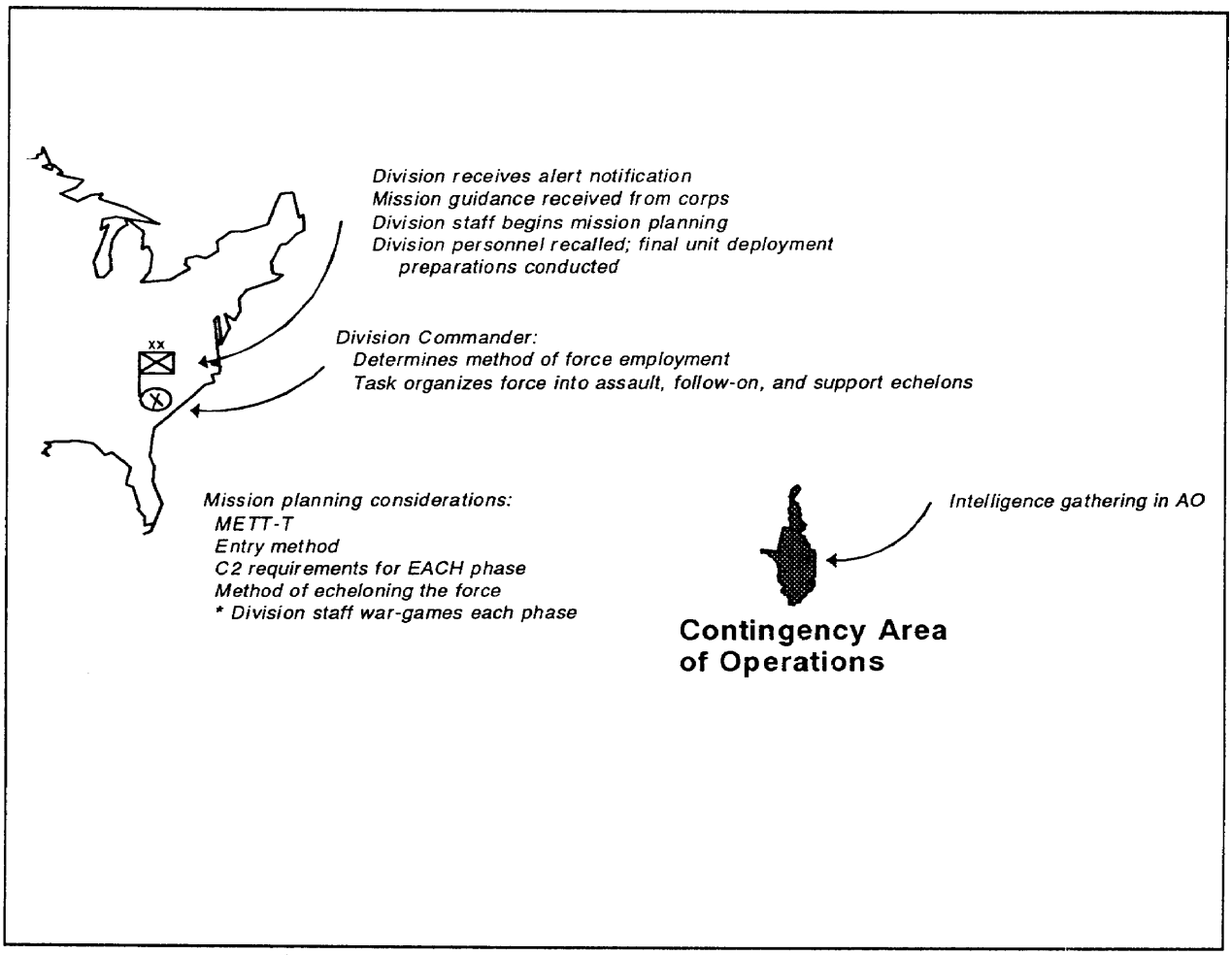


Figure 7-1. Predeployment and crisis action analysis

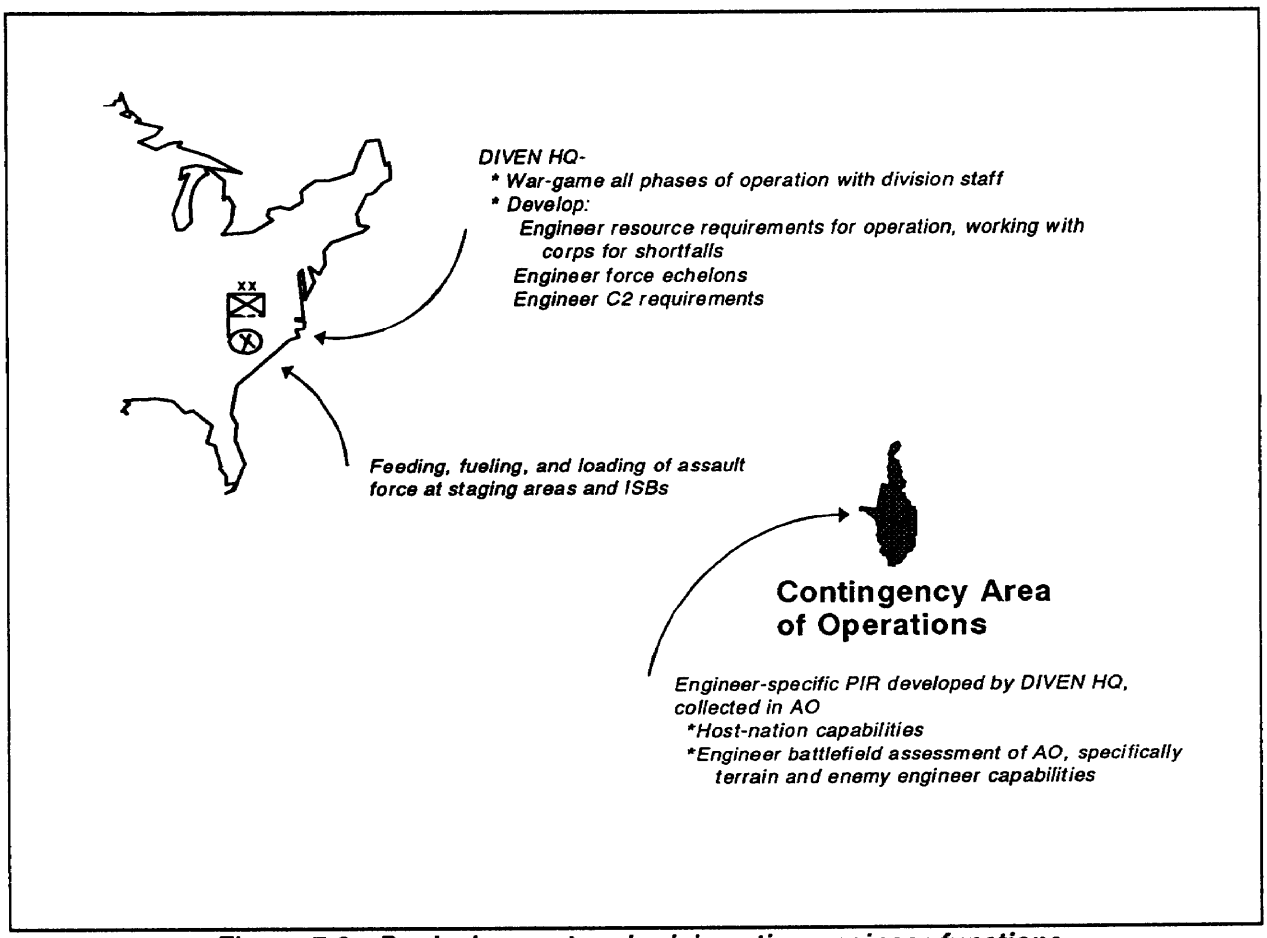


Figure 7-2. Predeployment and crisis action engineer functions

and are synchronized for the five phases of the operation. If the PIRs and IRs are accepted, they are forwarded through corps to be collected by SOF assets, allies, or other sources in the AO. (Some of these PIRs may have already been developed by higher headquarters and the information readily available). Examples of PIRs developed by engineers are–

- Locations and capabilities of host-nation engineer equipment sources and the availability of Class IV and V supplies in country.
- Capability of road network and bridges to support MSRs and requirements for improvement. Locations of materials to support maintenance.
- Anticipated condition of the airfields or ports after seizure and repair or upgrade requirements to support force buildup. Locations of materials to support maintenance.
- Ability of the lodgment area to support force buildup. Upgrade and sustainment engineering requirements.
- Extent of enemy obstacle and fortification preparations around the airfields or ports to be seized. Assessment of the force's ability to breach enemy defense.
- Enemy engineer capabilities and forces in the objective area.
- Enemy's ability to launch a counterattack on the airfield or port and the

requirements for a hasty defense to assist in repelling a counterattack.

- Critical facilities and assets that must be protected and made survivable.

Additionally, special forces reconnaissance efforts can be used to identify mobility/countermobility missions that may be beyond the capability of the assault force and require additional engineer augmentation. This helps drive the allocation of engineer forces/assets to the assault force, which would normally have to execute its own mobility/countermobility missions using organic assets.

Host-nation engineer equipment and Class IV/V (mines and demolitions) resources are a potentially valuable resource for the division. Critical engineer equipment is generally lift intensive. A major issue in contingency planning is identifying what engineer assets are mission essential and what host-nation support is available to the division. These host-nation resources are critical to reducing the lift assets consumed by engineer equipment and to trimming the engineer force and division Class IV/V supply requirements within transport constraints.

The division engineer continues the engineer estimate, developing a scheme of engineer operations for each phase and war-gaming them in order to finalize the engineer plan. This initial METT-T analysis is one of the most critical planning activities of this phase. The division engineer works with the G3 and corps to resource shortfalls in mission-essential engineer assets. When all available resources are allocated, the division engineer task organizes the available assets, balancing the required engineer force with lift constraints. Echeloning the engineer force ensures flexibility arid contributes to mission success.

Engineer C2 requirements are also vital areas of consideration during this phase. The division engineer war-games each operational phase of the contingency and develops echeloned engineer C2 packages that best augment and support the maneuver commander. Augmentation from corps engineers will be common, if not essential, to all phases. Therefore, the echeloned engineer C2 system must be designed to accommodate additions and deletions from the engineer force without disruption or degradation of operations. Considerations must address C2 of activities ranging from sustainment engineering to offensive and defensive support for both light and armored task forces.

Deployment and Initial Combat Actions

This phase initiates the operation and includes the establishment of and movement to an initial lodgment in the objective area. The strength and composition of the first elements to arrive in the AO will depend on METT-T, to include friendly host-nation forces which could provide security, enemy strength and capabilities, and the availability of forward-deployed US forces to provide support. Depending on the crisis, the division may follow forced-entry operations conducted by another force or conduct their own forced- or nonforced-entry operation. Figure 7-3 shows a phase 2 analysis.

Forced-entry operations are frequently conducted by Ranger assault forces, with the division's assault echelon conducting a relief of the forced-entry force. The relief in place is planned during the predeployment phase of the contingency mission. The ADE and the assault-echelon brigade engineer (and supporting engineer battalion or company commanders, if available) attend coordination meetings during planning and throughout the execution of the mission. Critical engineer-specific information must be collected, developed, and passed from the Ranger regimental engineer cell or Ranger

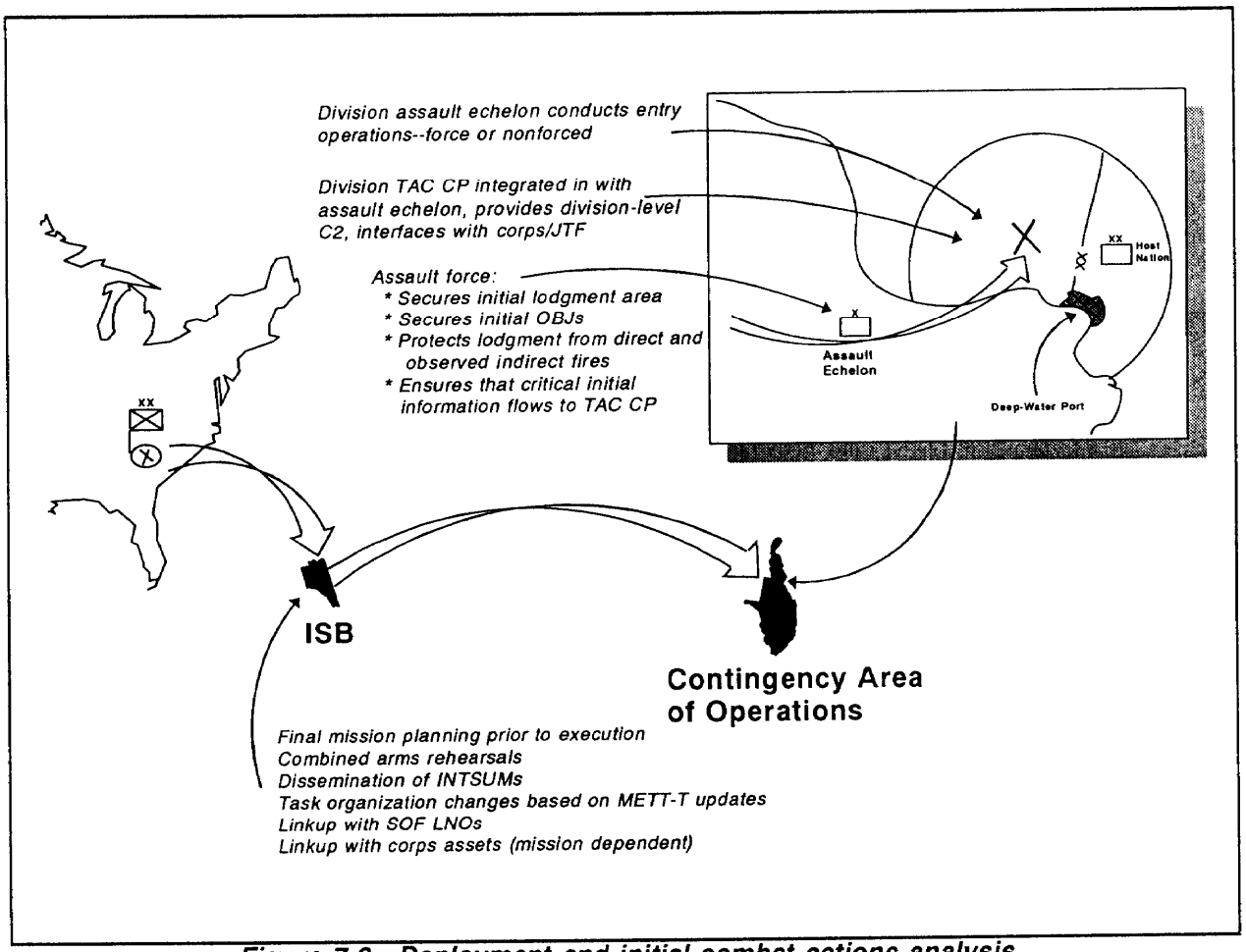


Figure 7-3. Deployment and initial combat actions analysis

battalion engineer cell to the relieving division. This information is passed to the division or to the echelon commanders as it becomes available. This is accomplished either at the staging base, at the intermediate staging base (ISB), en route to the objective area, or at the arrival airfield, lodgment, or port. Examples of information to be passed are–

- Current airfield and port operational conditions: usable length, width, surface condition, and composition.
- Initial airfield and port repair and upgrade estimates.
- Obstacle plan or overlay of obstacles in lodgment area: planned, plotted, and executed, to include plans for obstacle turnover from relieved force to relieving force.
- Enemy obstacle and counterobstacle capabilities, including description, location, and employment techniques of mines and explosives encountered. (UXO information is also included.)
- Location and condition of engineer equipment secured or located by the assault force and subsequent turnover of engineer-specific items left or seized by the relieved force.
- Class IV/V (mines and explosives) stockpiles in lodgment area.
- Engineer characteristics of the AO.
- Engineer contact point for the final exchange of information during the relief.

When the division conducts its own entry operations (forced or nonforced), this same information must be developed by the assault force engineer (usually the brigade engineer for the assault echelon) and passed to the engineer in the TAC CP.

A brigade headquarters serves as the base for each assault force and is complemented with appropriate combat, CS, and CSS units (Figure 7-4). Missions and objectives are assigned to the assault force based on METT-T. The assault force secures its initial objectives to establish and maintain a secure lodgment and to protect it from direct and observed indirect fires in order to safely land follow-on forces during the next phase of the operation.

A fully staffed division TAC CP normally accompanies the assault echelon. Its purpose is to provide division-level C2 and to interface with corps and EAC elements prior to the arrival of the main CP. The ADE or the DIVEN Operations and Training Officer (US Army) (S3) (with selected members of his staff) normally serves as the initial base for division-level C2 within this element. He fulfills all duties and responsibilities as laid out in Chapter 2 as well as being the center of C2 until the division engineer arrives in the contingency AO. It is important to note

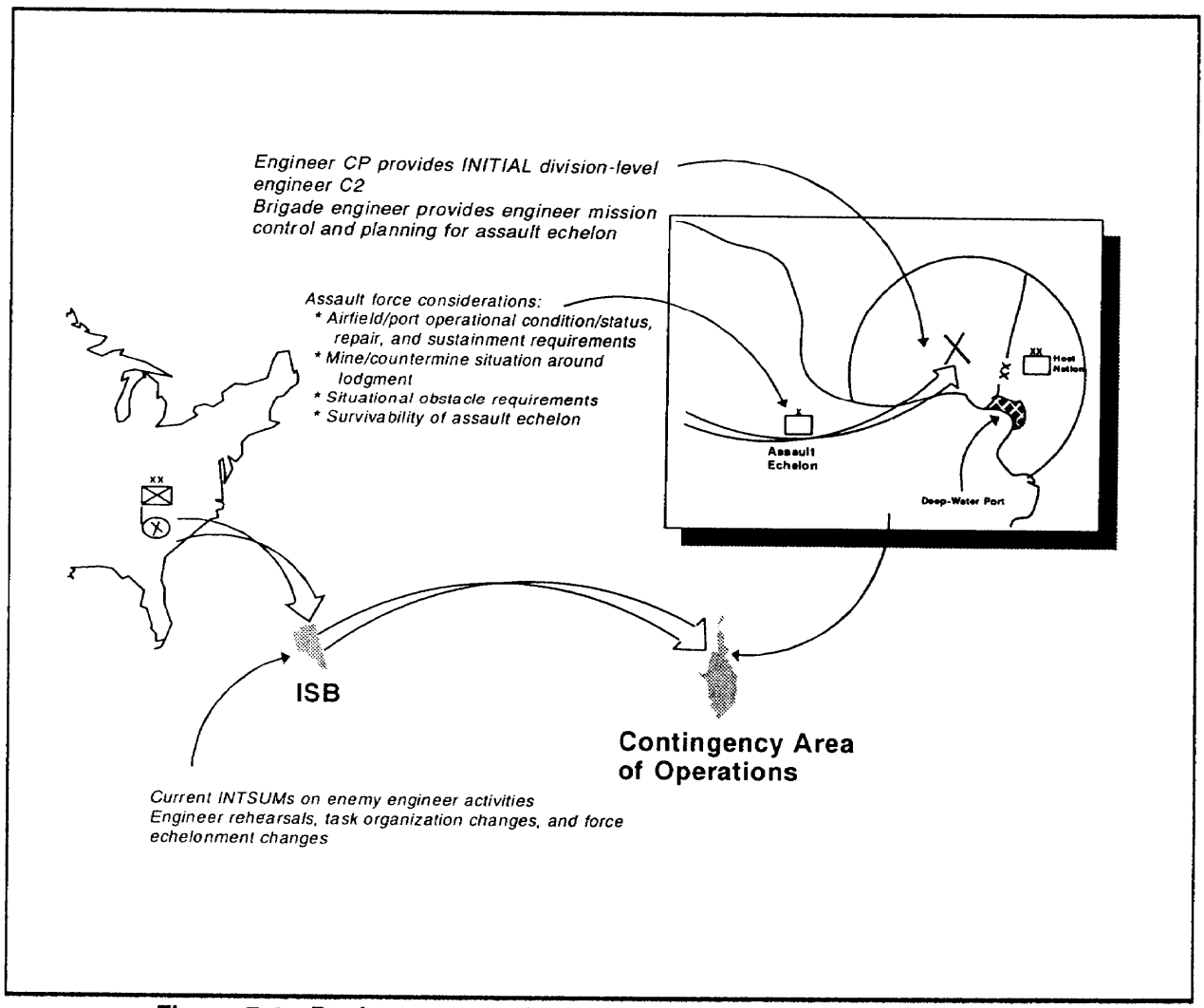


Figure 7-4. Deployment and initial combat actions engineer functions

that this engineer cell in the TAC CP is providing the initial division-level engineer C2 and conducting critical synchronization and coordination with corps or JTF headquarters. Brigade headquarters, with its associated brigade engineer, provides the C2 base for each assault force.

Securing and sustaining the lodgment area is critical to phase 2 and to the success of the contingency operation. The assault force must be prepared and resourced to repel a mounted or dismounted counterattack quickly. Based on coordination with the G2 and G3, the division engineer plans obstacle zones to support emplacement of situational obstacles. The assault echelon is resourced with required Class IV/V supplies and scatterable mine assets.

The lodgment will be either a port, airfield, or beachhead. Repairing, improving, and sustaining the lodgment is vital to allow force buildup, regardless if the assault echelon conducts a forced or nonforced entry. During the initial phases of a contingency operation, the division is responsible for lodgment sustainment. These activities require specialized equipment that is not organic to division engineers and must be resourced by corps. If the lodgment is an airfield, follow-on responsibility of the arrival airfield must be coordinated between the division and with the JTF air component commander during phase 1.

Also during phase one, the division engineer develops requirements for division and EAC engineer support. Because of the criticality of these specialized engineer assets in sustainment engineer missions, they are commonly task organized with the assault echelon. Corps is the provider of these engineer assets for division engineer resource shortfalls, and these assets are initially under a command relationship to the division. As the contingency operation progresses through the phases, these corps and EAC engineer assets are phased to a support relationship, releasing command responsibilities from the division commander to a corps or JTF C2 package upon its arrival.

While the DISCOM controls the feeding, fueling, arming, maintaining, and loading of the assault force, the division engineer uses this time prior to deployment to ensure that all last-minute, engineer-specific details are addressed for the assault echelon. Intelligence summaries (INTSUMs) and information collected on PIRs and IRs developed during phase 1 are disseminated. Significant changes to the flow of the assault echelon are difficult to effect once the flow has begun. Quick, yet detailed, engineer estimates based on these INTSUMs (and by contingencies developed during phase one planning) can allow the division engineer to recommend changes of engineer support to any of the three echelons. Any changes to logistic requirements and assault force task organization should also be resolved.

Force Buildup and Combat Operations

This phase begins with the division's introduction of follow-on forces into the contingency area airfield, port, or beachhead (Figure 7-5, page 7-10). Division staff planners must ensure that the assault echelon is fully resourced for all likely contingencies. Its primary focus is to build up combat power as quickly as possible and to expand combat operations rapidly. The objective is to place a force on the ground that can take the fight to the enemy while follow-on forces continue to arrive and prepare for subsequent operations. These follow-on forces reinforce and support the assault force.

Support to combat operations in this phase is decentralized. The division engineer ensures that freedom of action and initiative is maintained by his subordinates. This is accomplished by issuing clear mission guidance and intent and also through his staff's detailed and integrated mission planning. In doing this, the division engineer

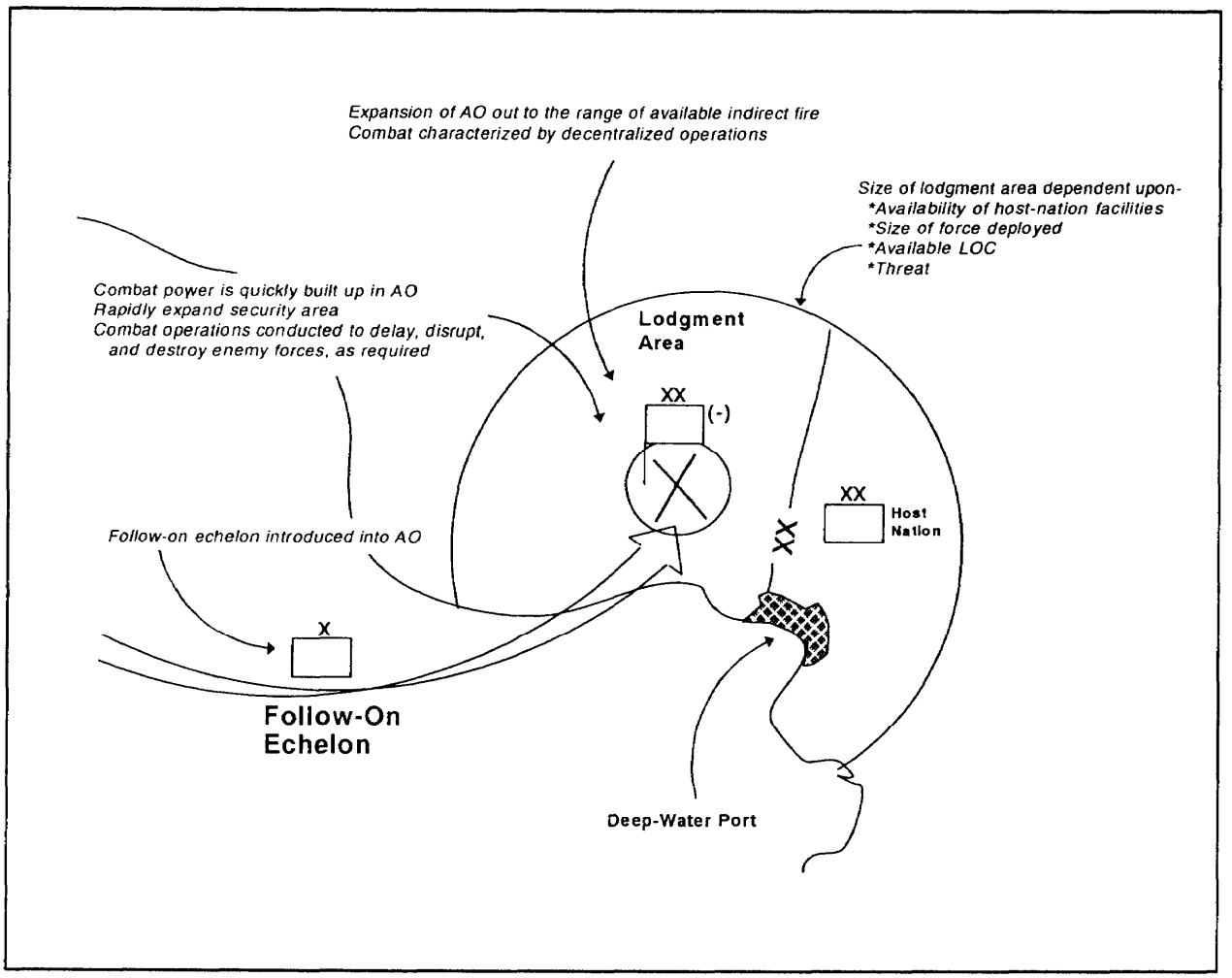


Figure 7-5. Force buildup and combat actions analysis

maintains his staffs mission planning focus, allowing the brigade engineers to focus on mission execution. This also ensures division's engineer mission guidance and intent does not conflict with that of the maneuver brigade commanders.

During force buildup and initial combat operations, engineer priority shifts to supporting offensive operations in expanding the initial lodgment area as well as sustainment engineering required for the lodgment area (Figure 7-6). The ultimate goal of engineer support during this phase is to maintain the speed of the force buildup and ensure the speed and flexibility of the committed maneuver forces. The success of decisive combat operations can hinge on the ability to accomplish this mission, ensuring the division does not lose the initiative.

Engineer forces supporting combat operations are task organized to maneuver units to support assault breaching and hasty defensive operations. Forces task organized with maneuver brigades must be compatible with each type of maneuver force in capabilities and requirements. These combined arms forces must be capable of self-sustainment (from the supported force) for the duration of force buildup. In the assault echelon, a light engineer company or task-organized team supports each deployed light maneuver brigade while another engineer

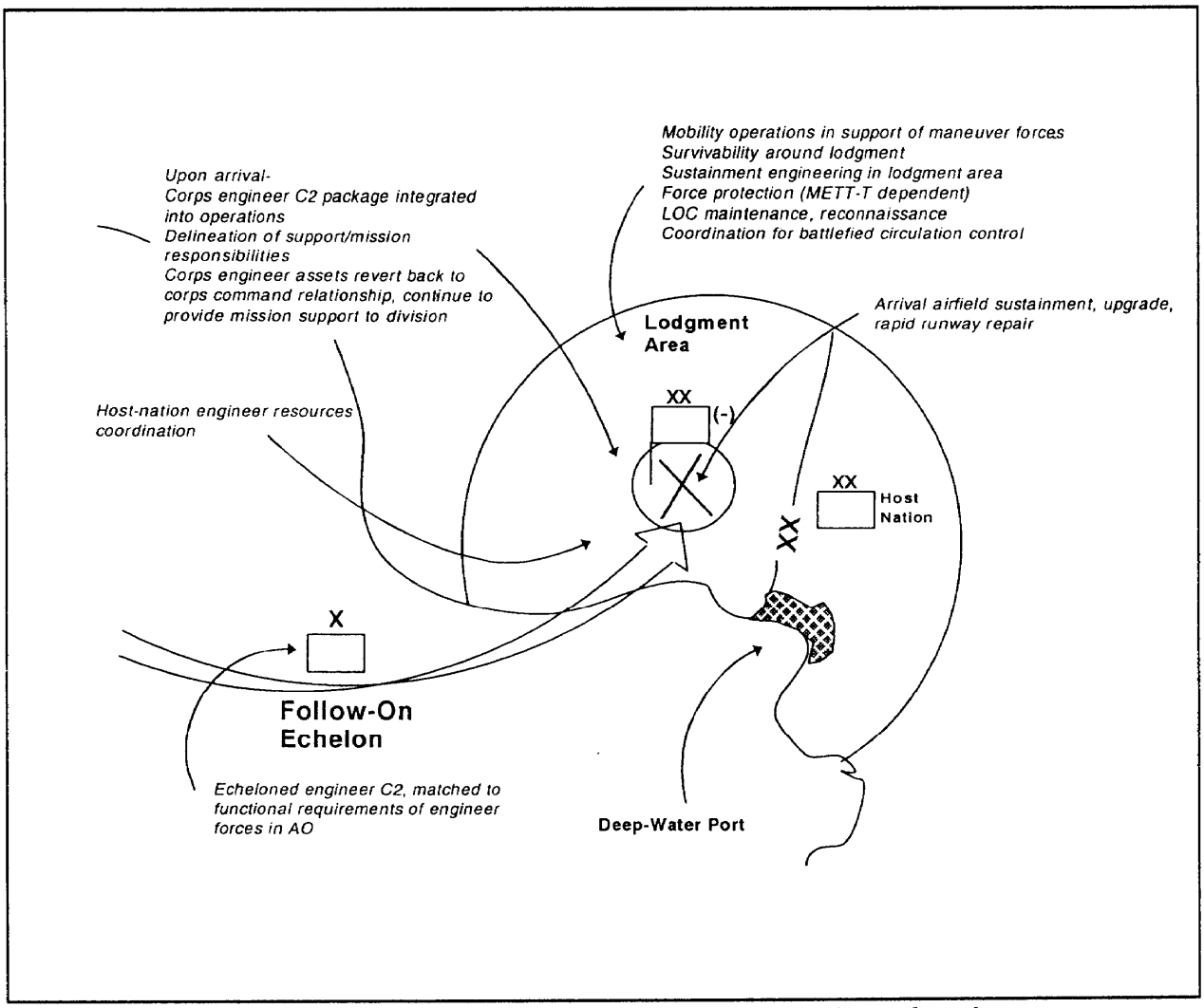


Figure 7-6. Force buildup and combat actions engineer functions

company (usually corps or EAC) conducts sustainment engineering in the lodgment area.

LOC maintenance becomes a critical mission as force buildup is completed and the force begins conducting decisive combat operations. This becomes particularly true as armored forces are employed with the light forces in the AO. A method of support is to consolidate available blade assets under the light engineer battalion and form them into LOC maintenance teams. Some blade assets may be required for survivability effort of critical assets in the lodgment area.

Decisive Combat Operations

This phase is an extension of the force buildup and combat operations phase (Figure 7-7, page 7-12). Combat forces and a logistic base are concurrently established and expanded to support decisive operations. As the situation in the lodgment area is stabilized, the division performs expanded combat operations as directed by higher headquarters from the lodgment area, then continues to eliminate the enemy force.

The priority of engineer effort shifts to supporting the brigades involved in MTCs, sets,

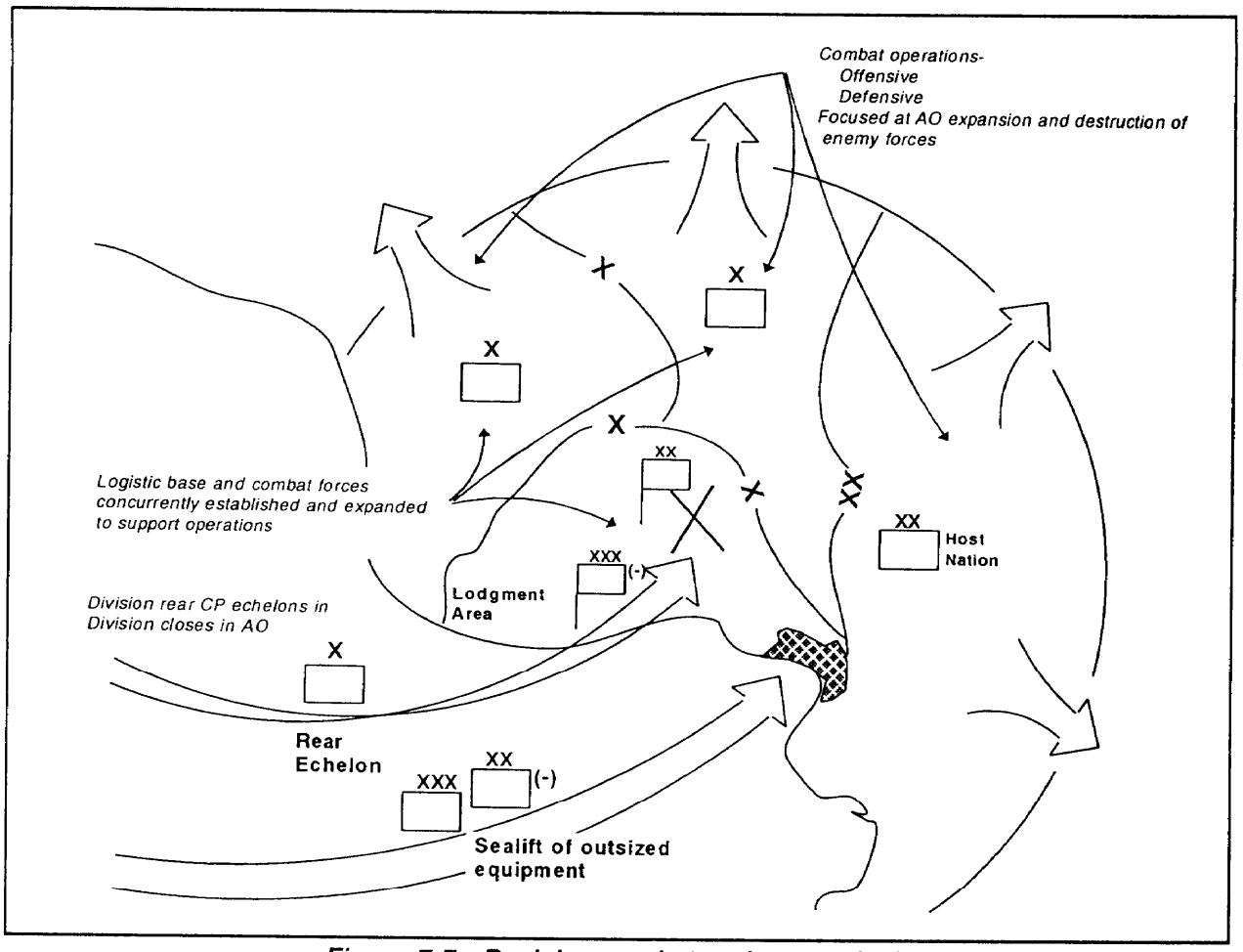


Figure 7-7. Decisive combat actions analysis

HATKs, and DATKs (Figure 7-8). Maneuver brigades are commonly task organized with a mix of light and armored maneuver forces; likewise, engineer forces task organize with an appropriate mix of armored and light forces, capitalizing on the strengths of each type of engineer force. The light division engineer company, task organized with critical equipment and light or armored elements, is the base organization supporting a light maneuver brigade. A mechanized engineer battalion is the base organization supporting an armored maneuver brigade. Task organizing an armored division engineer force to a light task force (brigade or battalion) requires that a CSS package accompany the armored engineer force. If this is not accomplished, it will shift the armored engineer's logistical burden to the light force CSS structure, which is beyond its capability. Armored and light division engineer company commander's receive planning guidance from the light brigade staff engineer.

An armored brigade task force should be supported by an armored division engineer battalion. An armored battalion task force should be supported by an armored division engineer company. By design, armored engineer forces have the requisite mechanical breaching capability, assault bridging assets and obstacle emplacement capability required to support an armored force. The armored division engineer battalions are dependent upon the supported armored brigade's FSB for sustainment.

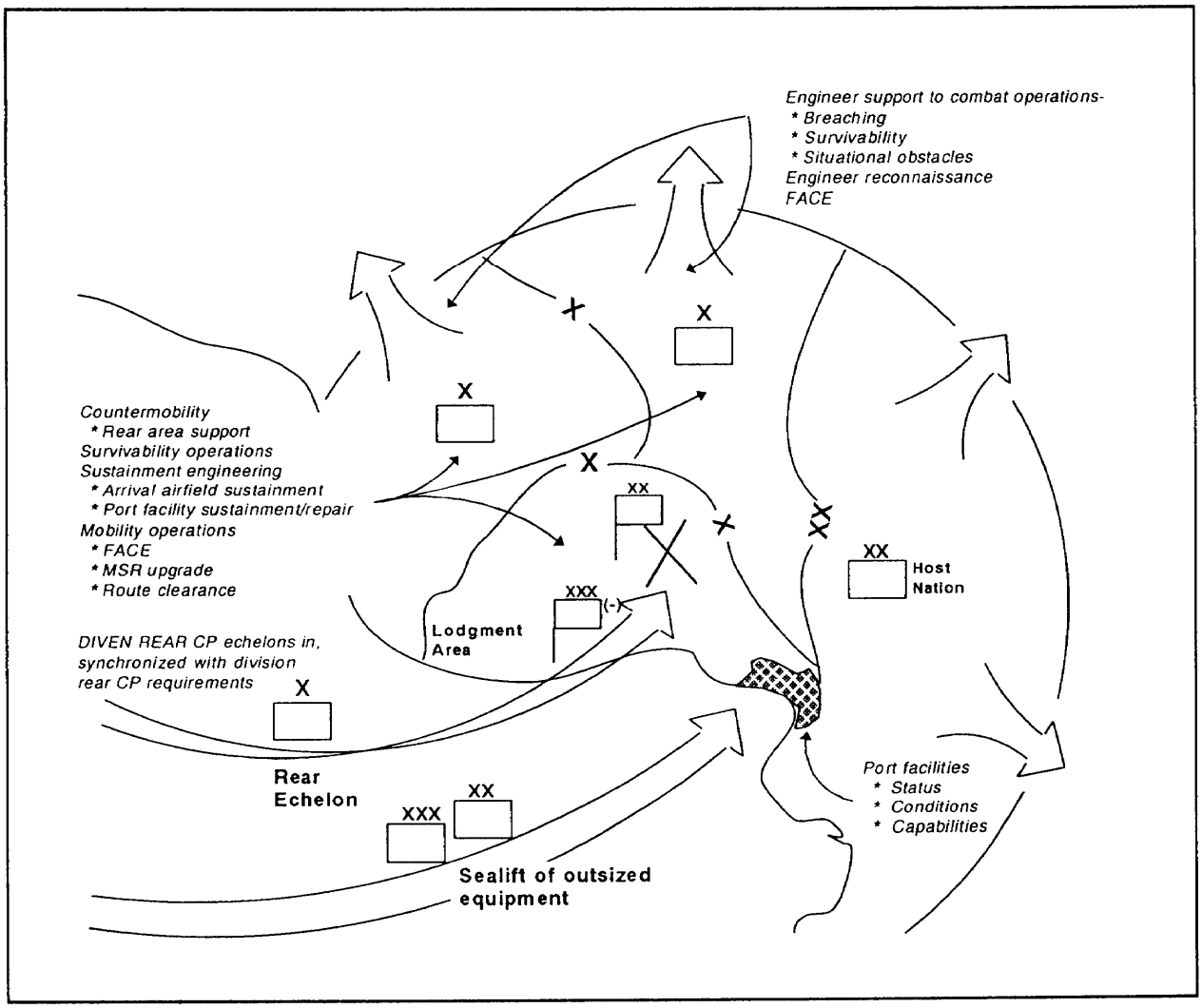


Figure 7-8. Decisive combat actions engineer functions

While the priority of engineer effort is brigade task force combat operations, the importance of sustainment engineering to the success of the division lodgment cannot be underestimated. The mission requires the division engineer's dedicated efforts to monitor all assets that will be operating in the division lodgment area, while ensuring that the maneuver brigades have the required forces to conduct combat operations. Engineer support in decisive combat operations is developed in depth in Chapters 3 and 4.

Redeployment

There are three objectives in the final phase of a contingency operation. The first is to consolidate friendly control of the operational area; second, to redeploy the force as rapidly as possible to home station, an ISB, or another theater of operation (reconstituting the division for other contingency missions); and third, to shift operations from combat to nation assistance (Figure 7-9, page 7-14).

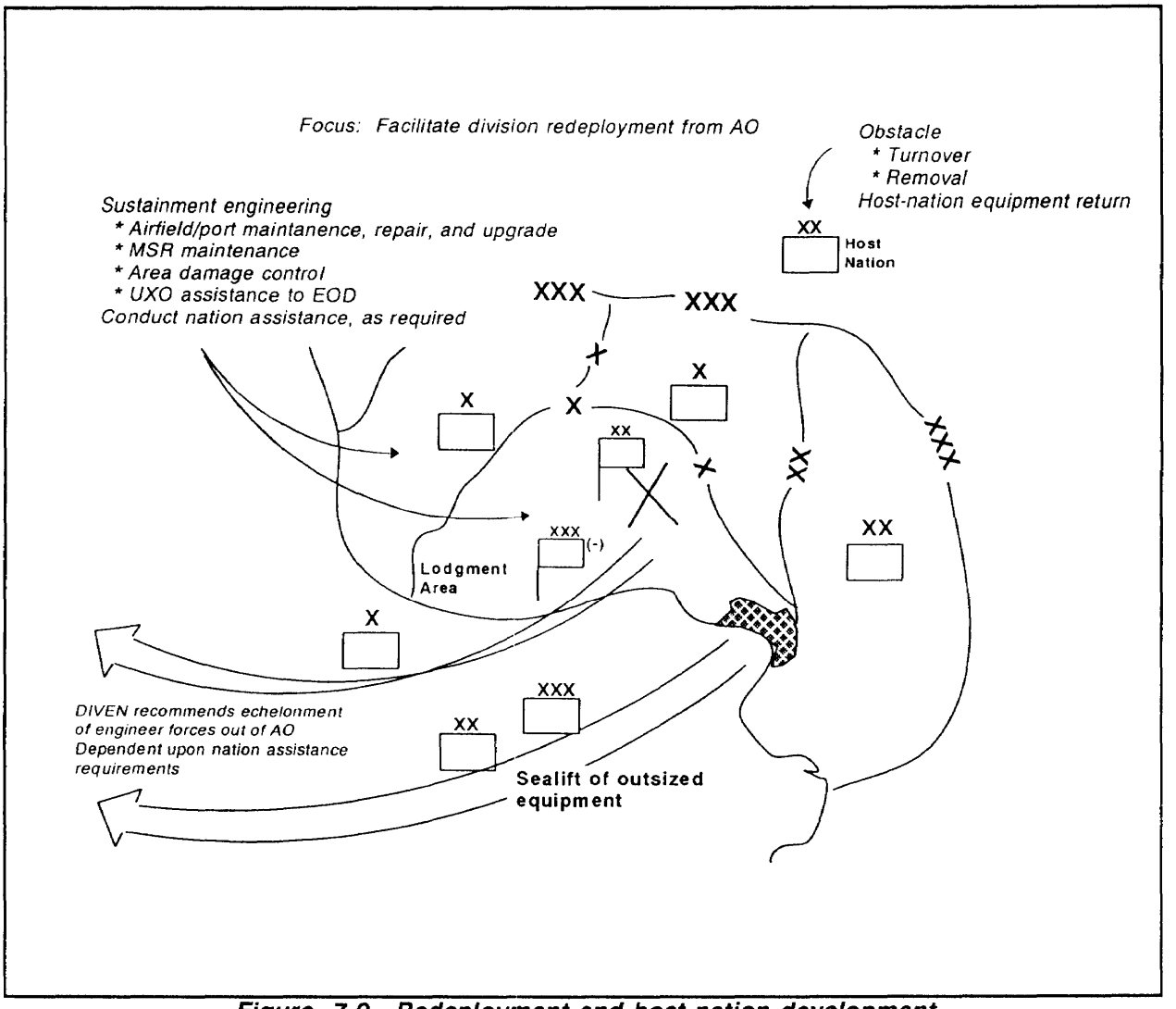


Figure 7-9. Redeployment and host-nation development

The division engineer's principal focus during this phase is sustainment engineering missions aimed at facilitating the division's redeployment (Figure 7-10). Examples of engineer missions and responsibilities are–

- LOC maintenance, repair, upgrade, construction, and sustainment.
- Departure airfield and port maintenance, repair, upgrade, construction, and sustainment.
- Area damage control.
- Turnover of obstacles to stay-behind forces or host-nation forces.
- Obstacle removal or clearance.
- EOD-supervised assistance with UXOs.
- Possible involvement in nation assistance operations.

The relative level of responsibility devoted to these areas by the division engineer is dependent upon the level of violence and duration of the operation; the size and es-

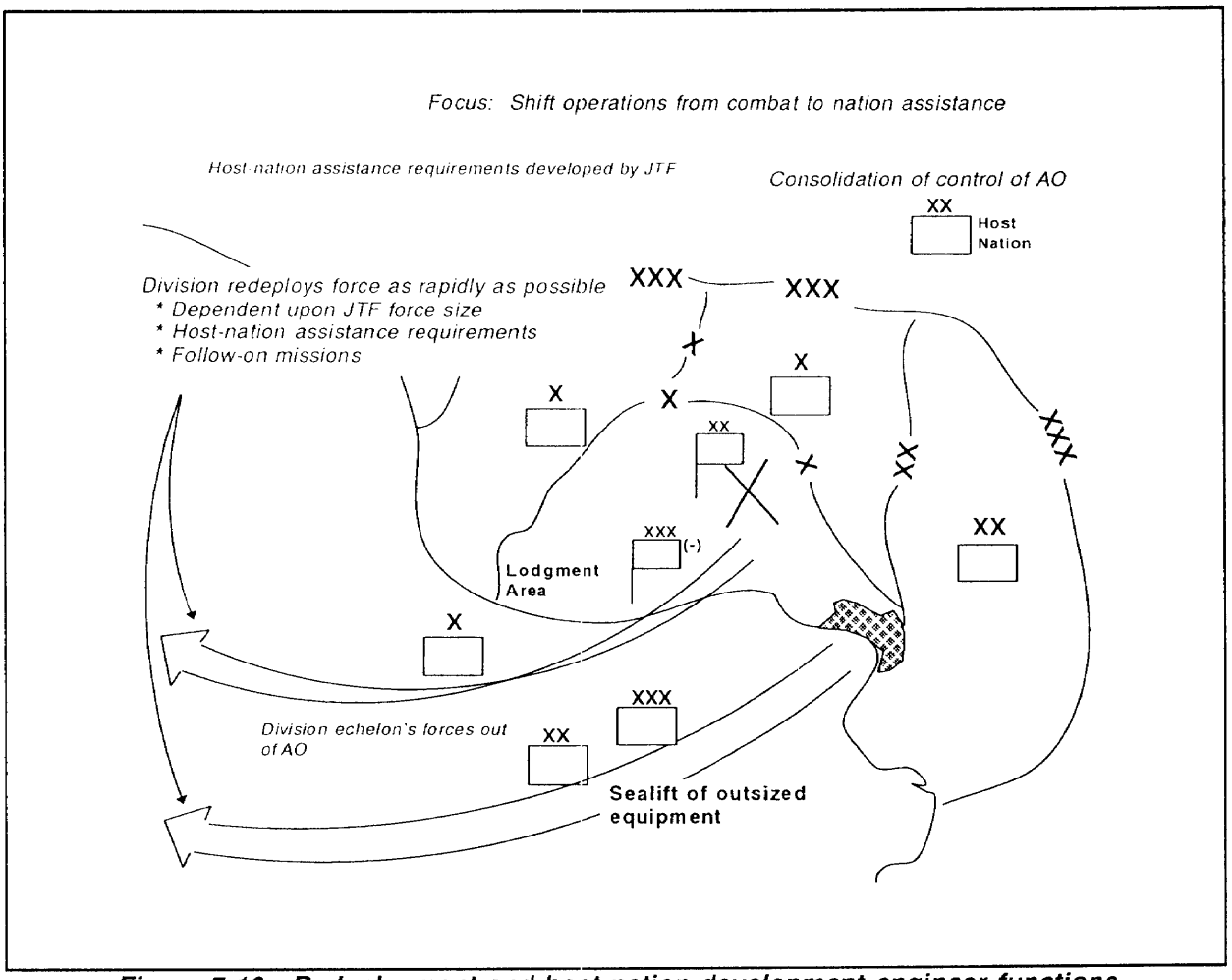


Figure 7-10. Redeployment and host-nation development engineer functions

tablished force composition of the division, corps, and JTF; and the maturity of the contingency operation area. Corps and EAC engineers, when available, will have the overriding responsibility for these missions, since the division engineer brigade (armored) and battalion (light) assets are limited in capability in providing the requisite level of support required.

A high level of violence and duration for the contingency operation will commonly dictate that the division engineer's functional responsibility will be low, with the corps or JTF having overall C2 of the phase. Forces at that level will conduct the sustainment engineering missions characteristic of this phase. Coordination between the division engineer and the corps engineer will verify the division's involvement and level of responsibility for engineer missions.

The division engineer then focuses on those actions directly related to the redeployment of the division and organic engineer assets. Division engineers will normally redeploy with their supported brigades, leaving the contingency area the same way they entered. Engineer mission requirements may require that some assets (particularly equipment) be redeployed later in the redeployment flow, remaining in the contingency area to provide support as required.

In those contingency operations where the duration of the mission is relatively short and the predominance of forces in support of the operation are division engineers, the division engineer's involvement and responsibility are proportionately high. The presence of a corps or JTF engineer is key to the division engineer's level of responsibility.

While the division's focus will be on the redeployment of units, the division engineer focuses on the missions that facilitate and support the operation. Corps and EAC assets under a command relationship to the division are vital to this support. Assets organic in the division engineer units are limited in capability to provide mission support for redeployment.

APPENDIX A

ENGINEER ESTIMATE

The engineer estimate is an extension of the command estimate procedure. It is a logical thought process that is conducted by the engineer staff officer concurrently with the supported maneuver force's tactical planning process. The engineer estimate process–

- Generates early integration of the engineer plan into the combined arms planning process.
- Drives the coordination between the staff engineer, the supported commander, and other staff officers.
- Drives the development of detailed engineer plans, orders, and annexes.

Each step of the engineer estimate process corresponds to a step of the command estimate procedure. Like the command estimate, the engineer estimate is continuously refined. Table A-1 shows the relationship between these two estimates. A more detailed discussion of each step of the engineer estimate process is found below. The command estimate procedure provides the framework for discussion of the corresponding engineer estimate actions.

Table A-1. Command and engineer estimates

Command Estimate	Engineer Estimate
Mission	Mission
Facts and Assumptions	IPB/EBA
Mission Analysis	Engineer Mission Analysis
Commander's Guidance	Develop Scheme of Engineer Operations
Develop Courses of Action	War-Game and Refine Engineer Plan
Analyze Courses of Action	Recommend a Course of Action
Decision	Finalize the Engineer Plan
Actions and Orders	Issue Orders

Receiving the Mission

The staff engineer quickly focuses on several essential components of the basic order and engineer annex when he receives the mission. These are–

- The enemy situation.
- The mission paragraph.
- The task organization.
- The logistics paragraph.
- The engineer annex.

From these components, he determines–

- The type of operation (offensive or defensive).
- The current intelligence picture.
- The assets available.
- The time available (estimate).

Facts and Assumptions

Developing and refining facts and assumptions is a continuous process. The maneuver commander relies on the staff to present him with facts and assumptions on which he can base his mission analysis, restated mission, and course-of-action development. Facts and assumptions pertain to the enemy as well as the friendly situation. The staff engineer uses the EBA as the framework for developing facts and assumptions.

Engineer Battlefield Assessment

The EBA consists of three parts (see Table A-2):

- Terrain analysis.
- Enemy mission and M/S capabilities.
- Friendly M/S capabilities.

Terrain Analysis. Terrain analysis is a major component of the IPB. The objective of the terrain analysis is to determine the impact that the terrain (including weather) will have on mission accomplishment. The staff engineer supports the intelligence officer in this process. Normally, using the OCOKA framework (see Table A-3), they determine what advantages or disadvantages the terrain and anticipated weather offers to both enemy and friendly forces. This process has direct impact on planning engineer operations. See Table A-4, page A-4, for examples of how the components of OCOKA may impact engineer support.

Enemy Mission and M/S Capabilities. Threat analysis and threat integration are also major components of the IPB. Enemy mission and engineer capability is a subcomponent of the threat analysis and integration process. The staff engineer supports the intelligence officer during the threat evaluation by focusing on the enemy's mission as it relates to enemy engineer capability. When executing this component of the EBA, the staff engineer must first understand the enemy's anticipated mission (attack or defend) and consider how enemy

Table A-2. Engineer battlefield assessment

- Develops facts and assumptions about—
  - Enemy engineer weaknesses.
  - Critical friendly engineer capabilities and requirements.
- Mutually supports the S2's IPB.
- Contains three components:
  - Terrain analysis.
  - Enemy mission and engineer capability.
  - Friendly mission and engineer capability.

Table A-3. EBA terrain analysis

- Analyze the terrain's impact on the battle using the OCOKA framework:
  - Observation and fields of fire.
  - Cover and concealment.
  - Obstacles.
  - Key terrain.
  - Avenues of approach.
- Advantages/disadvantages the terrain offers the enemy and the friendly force.
- Conclusions on the terrain's impact on accomplishing the mission.

Table A-4. OCOKA and sample M/S effects on planning

OCOKA	Examples of Effects on Engineer Support
Observation and Fields of Fire	Offense: Planning obscuration/location of the support force for breach operations. Defense: Obstacle distance from direct-fire systems (might also affect obstacle composition with reduced standoff). Limited fields of fire might limit certain obstacle effects (for example, fix and block).
Cover and Concealment	Offense: Planning obscuration/assault positions for breach operations. Impacts feasibility of conducting a covert breach. Defense: Impacts required effort for survivability and deception operations.
Obstacles	Offense: Task organizing special engineer mobility assets (AVLBs, ACEs). Plotting enemy countermobility effort, tying into existing obstacles. Defense: Tying in reinforcing obstacle to existing obstacles might require an increased countermobility effort.
Key Terrain	Offense: Targeting indirect-fire suppression and obscuration for breach operations. Defense: Obstacle intents tied to how valuable the key terrain is for retention.
Avenues of Approach	Offense: Capability to conduct in-stride, deliberate, and covert breaching operations. Focusing countermobility effort in a transition to a hasty defense. The need for flank protection. Defense: Focusing specific obstacle effects in a specific location in an avenue of approach. Size of avenue of approach impacts on required countermobility effort.

engineers will be doctrinally employed. the staff engineer then develops an estimate of the enemy's engineer capabilities. To do this, he uses the S2's order of battle and knowledge of enemy engineer organizations and other assets (such as combat vehicle self-entrenching capabilities) that may impact engineer operations. The staff engineer must also consider hard intelligence pertaining to recent enemy engineer activities.

The staff engineer then uses the S2's situation template and the enemy's capability estimate to plot the enemy's engineer effort and its location. Coordinating with the S2, the staff engineer recommends PIR and the engineer force necessary to augment the reconnaissance effort that will confirm or deny the situation template. Enemy engineer activities must be organic to the total combined arms reconnaissance and surveillance (R&S) plan. See Table A-5 for a quick summary on enemy mission and engineer capability analysis.

In the defense, the staff engineer plots–

- The enemy's mobility capabilities and location in the enemy's formation.
- The enemy's use of scatterable mines.
- Enemy engineers that support the reconnaissance effort.
- HVT recommendations (bridging assets, breaching assets, and scatterable mine delivery systems).
- The enemy's countermobility and survivability capabilities in a transition to a defense.

Table A-5. EBA enemy mission/engineer capability

- Anticipate enemy engineer operations and their impact on the battle.
- Consider the enemy's mission and doctrinal employment of engineers in battle.
- Estimate enemy engineer capability based on—
  - S2's order of battle.
  - Threat engineer organizations.
  - Manpower/equipment capabilities.
  - Recent activities.
- Plot enemy engineer effort based on—
  - S2's situational template.
  - Doctrinal engineer employment.

In the offense, the staff engineer plots the enemy's–

- Tactical and protective obstacle effort.
- Use of scatterable mines.
- Survivability and fortification effort.

Friendly Mission and Engineer M/S Capabilities. The third component of the EBA is to estimate the friendly engineer capability and its impact on mission accomplishment. To perform this function, the staff engineer uses the information he developed in the first step (receive the mission).

Knowing the type of operation, the engineer quickly prioritizes the development of capability estimates. The staff engineer considers engineer forces task organized to his supported unit as well as the assets that other members of the combined arms team unit have (such as mine plows) to determine the assets that are available. Assets under the control of the higher engineer headquarters and adjacent engineer units should be noted for future reference in the event a lack of assets is identified during course-of-action development.

Having determined the assets available and having already estimated and refined the time available with the S3, the staff engineer uses standard planning factors or known unit work rates to determine the total engineer capability. For example, in the offense, the engineer would focus first on the total numbers of breaching equipment (armored vehicle launched bridges (AVLBs), mine-clearing line charges (MICLICs), ACEs, engineer platoons, and combat engineer vehicles (CEVs)) and translate that into breach lanes. In the defense, the staff engineer would determine the number of minefield, hull-orturret-defilade positions, and tank ditches he could construct with available resources. The staff engineer will use the results of his capability estimates during the course-of-action development. See Table A-6 for an outline of this analysis.

The engineer combines his analysis of the terrain, enemy capability, and friendly capability to form facts and assumptions about–

- Likely enemy engineer effort and the most probable enemy course of action.
- Potential enemy vulnerabilities.
- Critical friendly requirements.
- The impact of the factors above on the mission.

Developing facts and assumptions is a detailed and sometimes lengthy process. The staff engineer must maintain his focus on the information required by the maneuver commander and his battle staff to make decisions. The EBA is a continuous process that is continually refined as the situation becomes clearer. Each time new information is collected or the conditions change, the engineer must evaluate its impact on the mission and refine the facts and assumptions as necessary.

Mission Analysis

The engineer participates in mission analysis by identifying engineer tasks that are mission critical and have an impact on the overall mission. The staff engineer identifies engineer tasks from the higher unit's entire OPORD, not just the engineer annex. The staff engineer must look in numerous places to fully understand the total scheme of maneuver, commander's intents, and instructions from the higher

Table A-6. EBA friendly mission/engineer capability

• Evaluate friendly engineer capability and its impact on accomplishing the mission. • Consider the friendly mission. • Estimate the engineer assets available based upon task organization of— - Maneuver forces. - Engineer forces. - Higher engineer headquarters. - Adjacent engineer units. • Consider the availability of critical resources. • Estimate the total engineer capability based on engineer planning factors.

unit's staff engineer. The staff engineer should concentrate on the following portions of the OPORD as he receives and identifies the engineer mission:

- Mission (paragraph 2).
- Commander's Intent (two levels up) (paragraphs 1b and 3).
- Scheme of Maneuver (paragraph 3).
- Scheme of Engineer Operations (paragraph 3).
- Subunit Instructions (paragraph 3).
- Coordinating Instructions (paragraph 3).
- Service Support (paragraph 4).
- Command and Signal (paragraph 5).
- Engineer Annex.

Mission analysis has several components, with the staff engineer focusing on engineer capabilities in each component:

- Specified tasks. Tasks derived directly from the WARNORD, OPORD, or commander's intent. Examples are obstacle zones, obstacle belts with intents, the required number of breach lanes, and the type of breach designated by the higher commander.
- Implied tasks. Implied tasks are developed by analyzing the mission in conjunction with the facts and assumptions developed earlier. For example, obstacle handover coordination during a relief-in-place mission, if not specified, is an implied task. A classic example of an implied task is identifying and planning a river-crossing operation to support an attack to seize an objective if a river crossing is necessary to accomplish the mission but is not specified in the higher OPORD.

- Assets available. The staff engineer should have already identified the available engineer assets in the EBA. The engineer should also examine the total force structure of the combined arms team. This will help the engineer as he participates in course-of-action development. For instance, the amount of firepower available may help to determine whether the force should conduct an in-stride versus a deliberate breach.

- Limitations (constraints and restrictions). Constraints are those specified tasks that limit freedom of action. Designated reserve targets, obstacle belts (with intents), and breach-lane requirements are examples of constraints the engineer must consider in his mission analysis. Restrictions are limitations placed on the commander that prohibit the command from doing something. Therefore, they impact greatly on the course-of-action development. Obstacle zones and belts are excellent examples of restrictions because they limit the area in which tactical obstacles can be placed.

- Risk. A commander might specify a risk he is willing to accept to accomplish the mission. For instance, the priority obstacle effort in a defense may be employed on the most likely enemy avenue of approach while situational obstacles are to be planned on the most dangerous avenue of approach as an economy-of-force measure. The staff engineer must understand how a risk involving an engineer capability will specifically impact on combined arms operations and advise the commander accordingly.

- Time analysis. The staff engineer must ensure that engineer operations are included in the combined arms time analysis. Time analysis has several steps. The first step is to determine the actual total time available. The staff engineer has established a fact or assumption of the time available while preparing the friendly capabilities portion of the EBA. The staff engineer now refines his time analysis. A good tool to use in this process is a basic timeline sketch that includes such items as–
  - The supported unit's OPORD.
  - The engineer unit OPORD.
  - Movement times.
  - Line-of-departure or prepare-to-defend times.
  - Rehearsals.
  - Hours of darkness or limited visibility.

This technique assists the staff engineer in accurately refining the estimate of the amount of time actually available and adjusting the friendly engineer capability accordingly.

- Essential tasks. Specified and implied tasks that are critical to mission success are identified as essential tasks. The engineer focuses the development of his plans, staff coordination, and allocation of resources on the essential tasks. The staff engineer does not ignore the other specified and implied tasks, but his planning centers on the essential tasks.
- Restated mission. The restated mission follows the same format as any mission statement. The who, what, where, and why are based on the mission analysis.

Commander's Guidance

The staff engineer needs to receive planning guidance to tailor the schemes of engineer operations that he will develop during course-of-action development. The amount of guidance required is based on the experience of the staff engineer and maneuver commander, the time available, whether habitual relationships between the engineer and maneuver units have been established, and SOPs. Some areas in which the staff engineer might require guidance are–

- Situational obstacle planning.
- Use of digging assets (survivability versus countermobility).
- Use of maneuver forces in the obstacle effort.
- Risk acceptance of M/S tasks.
- Interpretations of higher commander's intent pertaining to M/S.

Scheme of Engineer Operations

The next step of the command estimate is developing the maneuver courses of action. Course-of-action development centers on the employment of maneuver forces. However, the engineer assists in the process by considering the impact engineer operations has on maneuver. The staff engineer must participate in order to tailor the scheme of engineer operations for each course of action. The staff engineer develops a scheme of engineer operations for each maneuver course of action. He does not develop complete plans, just a concept. It is developed using the same steps as the maneuver course of action but without the detailed force allocation. If time permits, the engineer may begin working on the details for each plan. The process is as follows (see Table A-7):

- Analyze relative combat power. The staff engineer compares the anticipated enemy engineer capability with the friendly engineer capability needed to

Table A-7. Scheme of engineer operations development

1. Analyze relative combat power.
2. Identify engineer missions and allocate forces/assets.
3. Develop a scheme of engineer operations.
4. Balance requirements with assets available.
5. Integrate into the maneuver course of action.

defeat it. For example, in the offense, the staff engineer considers the enemy doctrinal norms, hard intelligence, recent activities, and the time the enemy has to prepare and determines if the friendly engineer capability is sufficient to overcome the enemy capability. Likewise, in the defense, the staff engineer looks at enemy capability and where and when he expects that capability to be employed and determines what will defeat it and what assets are available to ensure success.

- Identify engineer missions and allocate forces. Based upon the maneuver course of action, situation analysis, mission analysis, and commander's intent, the engineer assesses the engineer requirements. This is the most important step in developing a scheme of engineer operations.
- Develop a scheme of engineer operations. The scheme of engineer operations focuses on how the engineer efforts integrate into and support the maneuver course of action. Like the maneuver course of action, the scheme of engineer operations is generic without a specific engineer force allocation or unit designation. It must address all phases of the operation, particularly where engineer priorities must change to support the maneuver.
- Balance assets available against support requirements. The staff engineer reviews his scheme of engineer operations in light of the assets he has available (using his EBA product). Hasty estimate tools such as belt planning factors, blade-hour estimates, and breach-lane requirements are used to quickly assess whether adequate assets are available to support the plan. All shortfalls are noted and the scheme of engineer operations is refined, if necessary. The plan is refined by shifting assets to the main effort, shifting priorities with the phases of the operation, recommending to the commander to accept risk, or by requesting additional assets.
- Integrate into the maneuver course of action. The staff engineer prepares a statement describing the scheme of engineer operations. This statement addresses how engineer efforts support the maneuver course of action. He integrates the necessary graphics to illustrate this tentative engineer plan (for example, breach control measures and obstacle graphics and intents).

War-Game and Refine Engineer Plan

Staff analysis identifies the best course of action for recommendations to the commander. War-gaming techniques are used to analyze the courses of action. War-gaming is a systematic visualization of enemy actions and reactions to each friendly course of action. The staff engineer participates in war-gaming to–

- Ensure the scheme of engineer operations supports the maneuver plan and is integrated with the other staff elements.
- Further identify weaknesses in his plan and make adjustments, if necessary.
- Ensure the S2 integrates enemy engineer assets and actions as he plays the enemy force.

There are three techniques for war-gaming. See Table A-8.

The next step, after each course of action is independently war-gamed, is to compare the results. The goal of comparing courses of action is to analyze the advantages and

Table A-8. War-gaming techniques

Avenue in Depth This technique concentrates on one avenue of approach from start to finish. It is equally applicable to offensive and defensive operations. It allows the engineer to war-game the analyzed impact of enemy obstacles on the plan of attack and the effects of sequential obstacle belts or groups for the defensive plan. Belt The belt technique divides the battlefield into areas that run the width of the sector, war-gaming across the front and multiple avenues at once. This is the preferred technique. It allows the engineer to war-game the mutual support between obstacle belts and groups. It is the best method for analyzing mutual support and adjacent engineer effort. Box This technique focuses solely on critical enemy or friendly events in a designated area (box). The advantage of this method is that it is not time-consuming. It allows the engineer to focus on a particular breach site or engagement area.

disadvantages of a course of action relative to the other plans. Each course of action is compared to the others using specific evaluation criteria. These evaluation criteria may be developed by the staff or may be directed to the staff by the commander during his planning guidance.

The staff engineer compares courses of action in terms of which scheme of engineer operations best supports accomplishing the mission. His comparison is only part of the total comparison by the staff.

Recommend a Course of Action

The objective of the comparison is to make a unified recommendation to the commander on which course of action is best. The engineer may have to give greater consideration to a course of action which he can least support if it looks like it is the best selection from the other staff perspectives. He must be prepared to inform the maneuver commander where he must accept risk or additional assets he will need to avoid that risk. The staff engineer must also be prepared to inform the maneuver commander where those assets may be obtained and what influence the maneuver may have to exert to get them. This is where knowledge of the higher and adjacent unit engineer assets becomes important.

Based on the staff's recommendations, the commander makes a decision on which course of action to adopt for final planning. He may select a specific course of action, modify a course of action, or combine part of several courses of action. In any event,

the commander decides and issues to the staff additional guidance for developing the plan. This guidance concentrates on synchronizing the fight, focusing on bringing the combat multipliers together.

Finalize the Engineer Plan and Issue the Order

The staff engineer focuses his planning efforts on the scheme of engineer operations for the selected maneuver course of action. The engineer determines the C2 necessary to accomplish the engineer missions (see Chapter 2 for additional information). The scheme of engineer operations is fine-tuned based on the war-gaming process, commander's guidance, and situation updates. As the engineer fills in the details of his plan, he refers back to his initial mission analysis to ensure that all missions have been taken into account. The staff engineer ensures all engineer tasks are assigned to maneuver and engineer units as part of the subunit instructions. Final coordination is made with other staff members to ensure total integration and mutual support.

The staff engineer conveys his written plan through his input in the basic OPORD (scheme of engineer operations, subunit instructions, coordinating instructions paragraphs) and the engineer annex (see Appendix B). As part of the combined arms staff, the engineer also participates in the OPORD brief to the assembled command group. As with the other primary staff officers, the engineer gets only one chance to brief the command group on the scheme of engineer operations. This is the first step in a properly executed and well-coordinated engineer plan. The focus of the staff engineer is briefing the subordinate commanders; the maneuver commander and staff should already know the plan. It helps to develop standard briefs as a guide. Time is always critical; repeating information covered by other staff members should be avoided, and only critical items should be covered, to include SOP items. Above all, the staff engineer should be thoroughly familiar with the total plan so that he is comfortable fielding questions.

APPENDIX B

ORDERS AND ANNEXES

Orders and annexes are critical components of DIVEN C2. The DIVEN commander exercises functional control over engineer operations within the division (engineer units supporting maneuver brigades) by including critical instructions in the division order and the engineer annex. The DIVEN commander also issues a unit order to exercise both functional and unit control over forces committed to division-level operations (corps engineer units under the DIVEN commander's control). These units are normally task organized by the division under the con trol of the DIVEN commander. Therefore, it is imperative that the DIVEN commander understands how to use the combination of division and unit orders to convey the plan.

This appendix is divided into two major sections. The first section deals with the division OPORD and the engineer annex. This section provides the base format of the division OPORD, highlighting areas where the DIVEN commander may have direct input. It also outlines the format and content of the engineer annex as well as provides sample overlays. The second section focuses on DIVEN unit orders. It provides a format and content for the DIVEN unit WARNORD and OPORD, including possible annexes, overlays, and FRAGOs.

Division Orders and Engineer Annex

Division OPORD. Figure B-1, pages B-2 through B-4, is a sample format of the division OPORD. Paragraphs in which the DIVEN commander may provide engineer input are highlighted.

(Classification)

Copy ____of ____ copies
Issuing Headquarters
(Place (coordinates) country)
(Date-time group, month, year)
(Message reference number)

OPERATION ORDER (number) (code name, if used)

Reference(s): Map(s) and other references required.
Time Zone Used Throughout the Order:

Task Organization:

- **Must accurately reflect engineer task organization of the unit's supporting maneuver brigades, including the command or support relationship.**
- **Lists units under the DIVEN commander's command.**
- **Lists units remaining under division control.**

1. SITUATION.

a. Enemy Forces. Include recent enemy engineer activities or capabilities critical to maneuver brigade commanders or essential to understanding the DIVEN plan.

b. Friendly Forces.

c. Attachments and Detachments.

- **State the effective time for engineer task organization if it differs from other units.**
- **Clarify or highlight changes in engineer task organization that occur during a phase of the operation. For example, releasing division control of bridge units back to corps.**

2. MISSION.

3. EXECUTION.

Intent

a. Concept of the Operation.

(1) Maneuver.
(2) Fires.
(3) Counter-air operations.

Figure B-1. Division OPORD

(4) **Intelligence.**

- **Include the focus of intelligence-collection efforts that impact on the maneuver plan.**
- **Provide subordinate units with information requirements that are command PIR, as coordinated with the G2 and the division commander.**

(5) Electronic warfare.

(6) **Engineer.**

- **Describe the concept of engineer operations to support the maneuver plan.**
- **Establish the main effort by mission and unit for each phase of the operation.**
- **Focus primarily on support to close and rear operations.**
- **Discuss division-level missions only as they impact on brigade commanders.**

(7) (Others, as needed.)

b. Tasks to Maneuver Units.

- **Mission-essential tasks to be accomplished by a specific maneuver element.**
- **Mission-essential tasks to be accomplished by engineers task organized to maneuver elements.**

c. Tasks to Combat Support Units. May include division-level tasks assigned to the DIVEN organization. Only listed to inform brigade commanders of tasks under division control using division-level forces.

d. Coordinating Instructions.

- **Critical instructions common to two or more maneuver units.**
- **Does not normally include SOP information unless it is needed for emphasis.**
- **May include times or events in which obstacle zones become effective, if they differ from the effective time of the order.**

Figure B-1. Division OPORD (continued)

4. SERVICE SUPPORT.

a. General Concept of Logistics Support.

- **Concept for push of Class IV/V (mines) supplies.**
- Concept for logistics support of organic and supporting corps engineers task organized to maneuver brigades, if not listed in service support annex.

b. Materiel and Services.

(1) Supply.

- **Brigade allocations of Class IV or engineer Class V supplies, if not contained in the engineer annex.**
- Tentative locations for transfer of Class IV/V (mines) supplies to maneuver brigades.

(2) Transportation.

(3) Services.

c. Medical Evacuation and Hospitalization.

d. Personnel.

e. Civil-Military Cooperation.

f. Miscellaneous.

5. COMMAND AND SIGNAL.

a. Command.

b. Signal.

Acknowledge

Commander's Signature (optional)
Commander's last name
Rank

OFFICIAL:
(Authentication)

Annexes:

Distribution:

Figure B-1. Division OPORD (continued)

Engineer Annex. The engineer annex contains information not included in the base division order that is critical to the division engineer plan or required for subordinate engineer planning. It does not include instructions or orders directly to engineer units. All instructions or tasks are addressed to maneuver brigades, not supporting engineer units. More importantly, the engineer annex covers critical aspects of the entire engineer plan, not just parts that pertain to engineer units. The engineer annex is not a replacement for a unit order. For example, it does not give subunit orders and service support instructions to engineer units remaining under the DIVEN command; those orders and instructions are contained in the DIVEN unit order. The engineer annex should meet the following general criteria:

- Includes critical information derived from the EBA process.
- Contains all critical information and tasks not covered elsewhere in the order.
- Does not contain items covered in SOPs, unless the mission requires a change to the SOP.
- Contains information and tasks directed to major subordinate elements of the division, not supporting engineer units.
- Is clear, complete, brief, and timely and avoids qualified directives.
- Includes only information and instructions that have been fully coordinated with other parts of the OPORD, division commander, and staff.

The engineer annex includes any combination of written instructions, matrices, or overlays necessary to convey the necessary details of the engineer plan. The engineer annex outlined below provides a standard format for both offensive and defensive operations. This format standardizes the organization of information included as written instructions. The actual content depends on the type of operation and engineer plan. A standardized annex format makes it easier for the engineer staff officer to remember what should be included as well as for subordinate staff officers to find required information. The format tailors the five-paragraph order to convey critical information.

The engineer annex may also include matrices and overlays, as necessary, to convey the plan. Matrices may be used as part of the body of the annex or as separate appendices. Matrices are used to quickly convey or summarize information not needing explanation, such as logistic allocations, obstacle zone priorities and restrictions, or task summary (execution matrix). Finally, overlays are used to give information or instructions and expedite integration into the overall combined arms plan. At division level, information included on overlays may include but is not limited to--

- All existing and proposed friendly obstacles and control measures (obstacle zones, restrictions, and lanes; directed or reserve targets; and division-level situational obstacles, including associated NAI/TAI).
- Known and plotted enemy obstacles (must also be on situation template).
- Logistic locations and routes, as they apply to engineer operations.
- NBC-contaminated areas.

Figure B-2, pages B-6 through B-9, is a sample format of a written engineer annex. Figures B-3 through B-5, pages B-10 through B-12, provide sample matrices and overlays.

ANNEX ___ (ENGINEER) TO OPORD _____

TASK ORGANIZATION: Lists engineer units only and task organizes them to maneuver brigades, the DIVEN organization, or the division.

- Lists all engineer units supporting the division and companies task organized to other than the parent unit.
- May include a summary of low-density equipment, as necessary, to clarify unit task organization.
- Addresses command/support relationships as appropriate.
- Clearly identifies changes in engineer task organization that occur during the operation.

1. SITUATION.

a. Enemy.

(1) Terrain. Critical aspects of the terrain impacting operations.

(2) Weather. Critical aspects of the weather impacting operations.

(3) Enemy engineer capability/activity.

- Known and plotted locations and activities of enemy engineer units.
- Significant enemy maneuver and engineer capabilities that impact on engineer operations.
- Expected employment of engineers based on the most probable enemy course of action.

b. Friendly.

- Designation, location, and activities of higher and adjacent engineers impacting on division or requiring coordination.
- Nonengineer units capable of assisting in engineer operations (nonengineer units capable of emplacing scatterable mines).

c. Attachments/Detachments.

- Lists units attached or detached, only as necessary to clarify task organization.
- Highlights changes in engineer task organization occurring during operations along with effective times or events.

2. MISSION. Same as division mission statement.

Figure B-2. Engineer annex

3. EXECUTION.

a. Scheme of Engineer Operations.

- Describes the concept of operations to support the maneuver plan. Must tie critical tasks or main effort to the division defeat mechanism.
- Establishes main effort of engineer effort by mission and unit for each phase of the operation.
- Focuses primarily on engineer support to close operations.
- Discusses division-level missions only as they impact on brigade commanders.

(1) Obstacles.

- Supplements the narrative above, focusing specifically on details of the counter-mobility effort.
- Identifies obstacle zones used to support the division deep, close, and rear operation. Assigns zone responsibilities, priorities, and restrictions to obstacle zones. Zone restrictions may preclude the use of certain types of mines or obstacles or the use of obstacles on specific routes through zones.
- Identifies, prioritizes, and assigns responsibilities for division-directed and reserve targets. Also provides execution criteria for reserve targets.

(2) Situational obstacles.

- Concept for the employment of situational obstacles, focusing on how they will be used to support the division maneuver plan.
- Division-planned and executed. Clearly identifies location, intent, and execution criteria of division-level targets planned and executed by the division.
- Division-planned/brigade-executed. Assigns responsibilities for executing division situation obstacles targeted and resourced by the division. Discussion must include details on NAIs, TAIs, DPs, and execution criteria.
- Division-resourced/brigade-planned and executed. Assigns intent and allocates resources to brigades. May also state execution criteria.
- For each type, clearly state the headquarters maintaining the authority to use scatterable mines and any restrictions on duration (by zone).

b. Subunit Instructions. (All tasks listed as brigade missions or to engineer units under division control.)

- Engineer tasks to be accomplished by a specific subordinate unit and not contained in the base OPORD.
- Engineer tasks to be accomplished by engineers supporting maneuver elements (only as necessary to ensure unity of effort).
- Division-level tasks assigned to the DIVEN organization are included. Only listed to inform subordinate unit commanders of tasks under division control using division-level forces.

Figure B-2. Engineer annex (continued)

c. Coordinating Instructions.

- Critical engineer instructions common to two or more maneuver units not already covered in the base OPORD.
- SOP information, only if needed for emphasis.
- Times or events in which obstacle zones become effective, if they differ from the effective time of the order.
- Division PIR that must be considered by subordinate engineer staff officers or that require reports to the ADE.
- Mission reports required by the ADE (if not covered in "Signal" paragraph or unit SOP).
- Explanation of engineer work lines, if used.

4. SERVICE SUPPORT.

a. Command-Regulated Classes of Supply.

- Highlights sub-unit allocations of command-regulated classes of supply that impact on the operation's control supply rate (CSR).
- May summarize in a matrix or table.

b. Class IV/V (Obstacle) Supplies Distribution Plan.

- States the method of supply (supply point or unit distribution) to be used for Class IV/V (obstacle) supplies for each sub-unit.
- Gives tentative locations for Class IV/V supply points or locations for linkup of corps push packages directly to units.
- Gives allocation of Class IV/V (obstacle) supplies by brigade, zone, or a combination. May be summarized in a matrix or table.

c. Transportation.

- Allocation and priority of support of corps and division haul or airlift assets dedicated to brigades for Class IV/V (obstacle) supplies haul.
- Requirements for brigades to supplement corps transportation of mission loads (for example, brigades responsible for haul forward of PL____, each brigade provides ___ heavy expanded mobility tactical trucks (HEMTTs) to haul mission).

d. Health Services Support. Address arrangements made for corps engineer units operating in division areas to accomplish division-level missions.

e. Host Nation.

- Type and location of host-nation engineer facilities, assets, or support.
- Procedures for requesting and acquiring host-nation engineer support.
- Limitations or restrictions on host-nation support (for example, host- nation personnel not authorized forward of PL_____).

Figure B-2. Engineer annex (continued)

5. COMMAND AND SIGNAL.

a. Command.

- Location of key engineer leaders.
- Designated a logical chain of command.
- Designated headquarters that controls the effort within work lines on an area basis.

b. Signal.

- Nets monitored by the ADE, division tactical command post (DTAC) engineer and division rear command post (DREAR) engineer for reports, if different than SOP.
- Designated critical engineer reporting requirements of subordinates, if not covered in coordinating instructions or SOP.

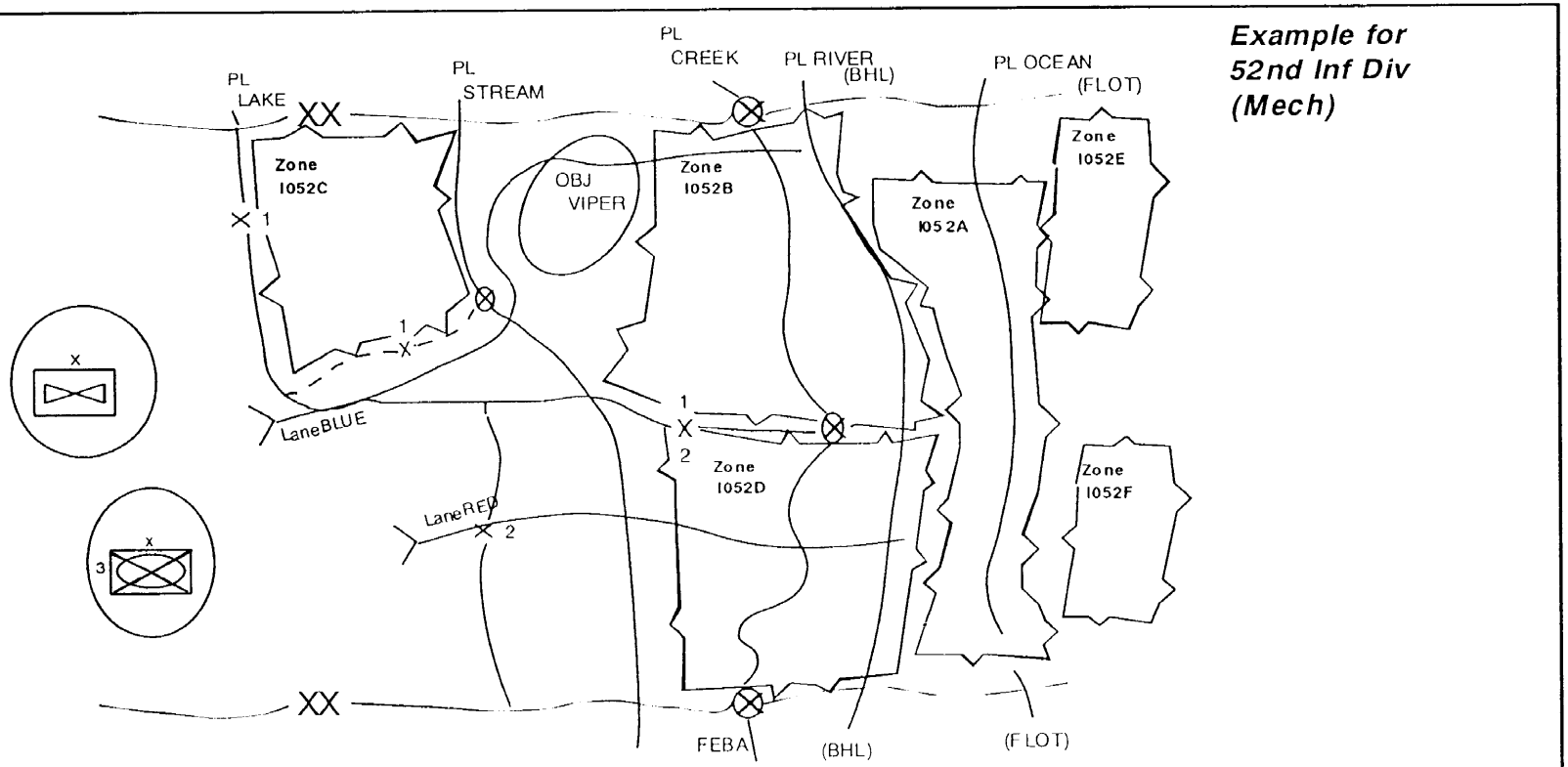
ACKNOWLEDGE

COMMANDER
Rank

Official.
/s/
Name
Position

Appendices

Figure B-2. Engineer annex (continued)



Unit	Zone	Priority	Restrictions
1st Bde	1052B	1 *(O/O 3rd Bde)*	Restricted along lane BLUE
1st Bde	1052C	4	
2nd Bde	1052D	2	Restricted along lane RED
AV Bde	1052E	5	Restricted no long duration SCATMINES
AV Bde	1052F	O/O	
CAV Sqdn	1052A	3	

NOTE
1052A
- *52nd Inf Div establishing HQs*
- *Obstacle zone ALPHA*

Figure B-3. Obstacle overlay

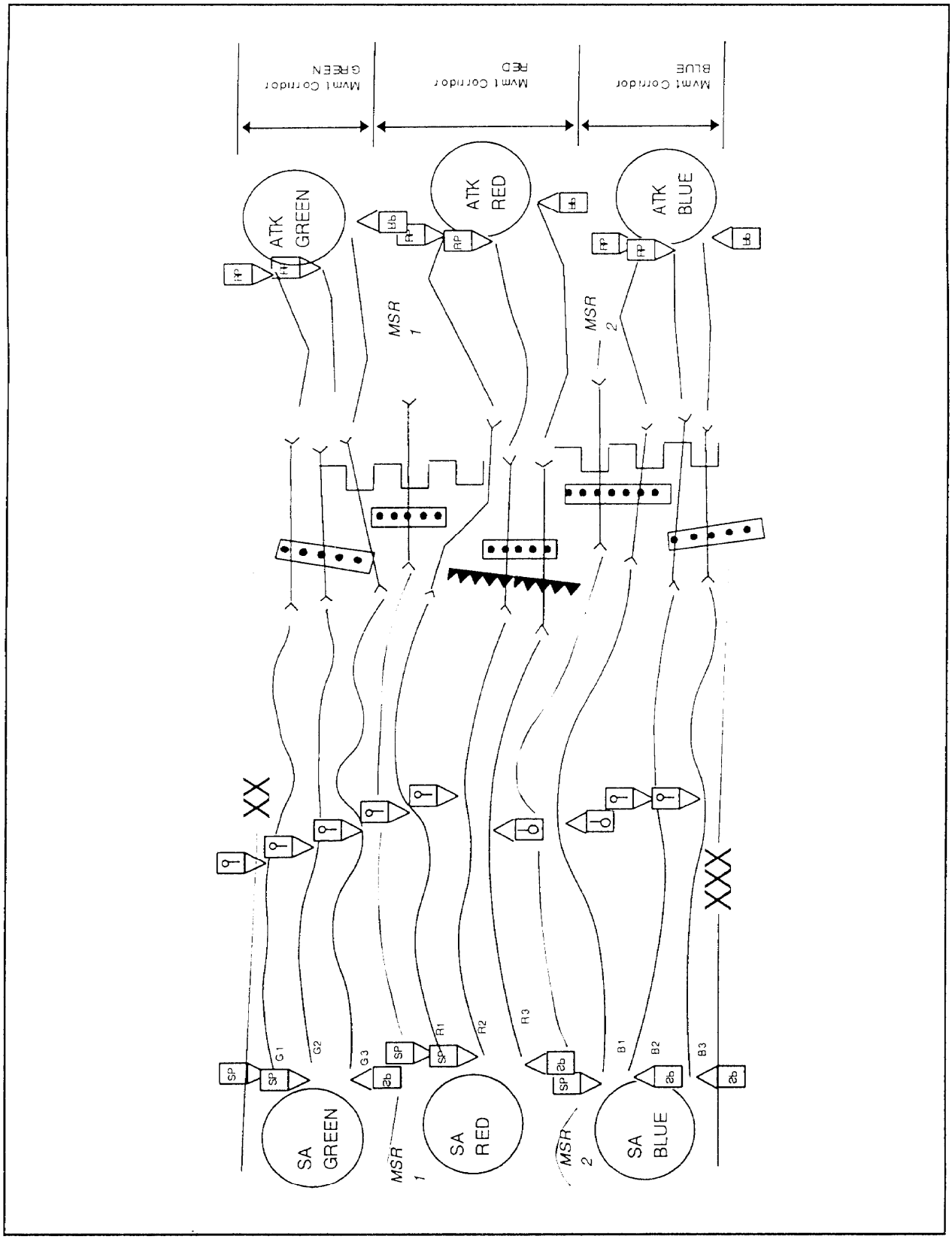


Figure B-4. Large-scale, breach-lane network

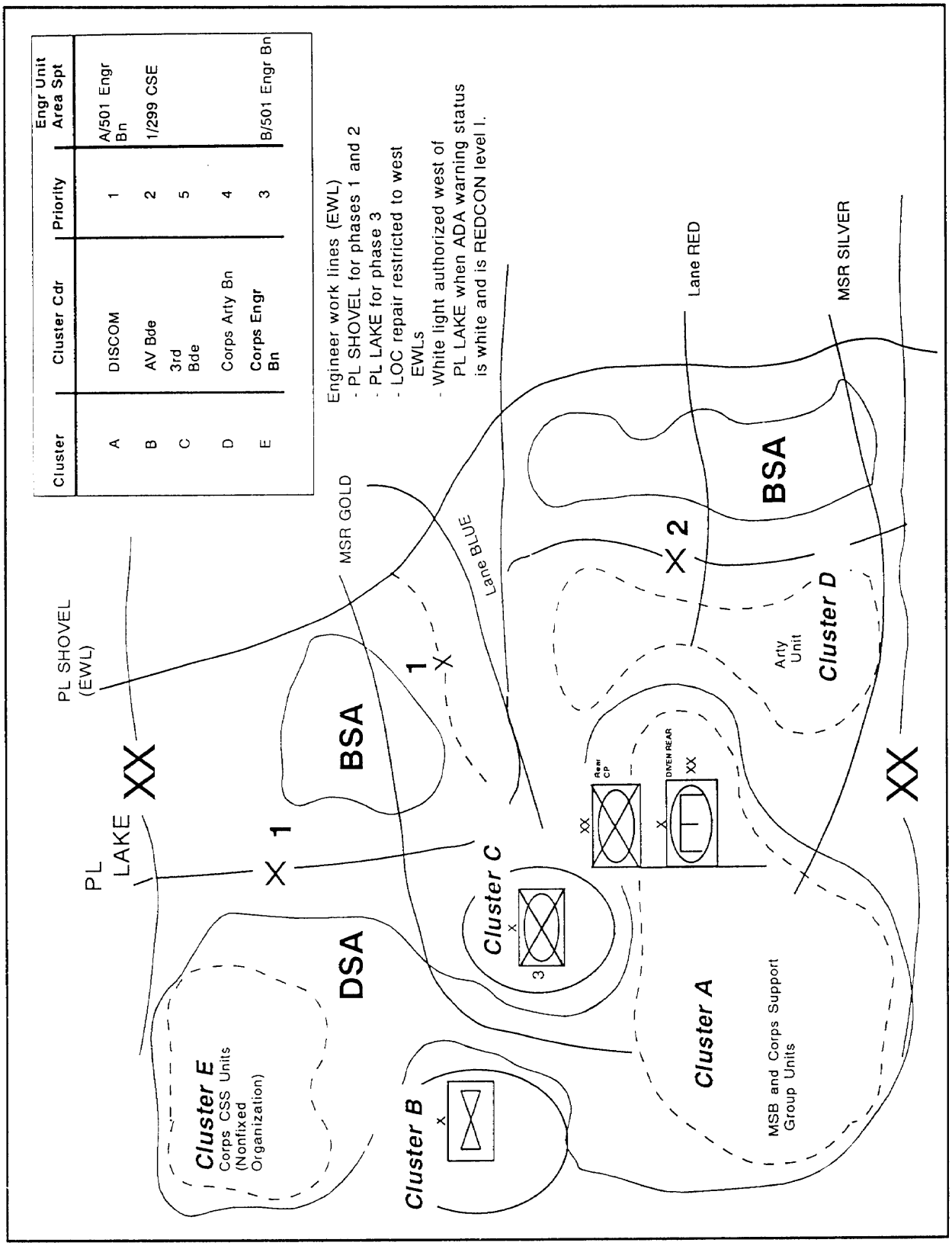


Figure B-5. Engineer rear area operations

Engineer Unit Orders

The DIVEN commander uses a unit order to exercise unit control over engineer units remaining under his command. At the outset of an operation, the DIVEN commander uses his order to effect the necessary task organization of engineers in the division, assign initial missions, and establish sustainment integration with the FSB, MSB, and corps support group (CSG). Once the task organization is effective and during combat operations, the DIVEN commander directs subsequent unit orders only to those engineers under his command. Orders missions, and instructions to engineers supporting maneuver brigades in command relationships are included as tasks to the brigades in the division order. The exception is the DIVEN unit WARNORD. The DIVEN commander issues WARNORDs to all engineers in the division to facilitate parallel planning within engineer units and brigade-level engineer staffs. WARNORDs to engineers supporting maneuver brigades are for planning only and are not executive.

DIVEN Unit WARNORD. The purpose of the WARNORD is to help engineer staff officers and engineer units initiate planning and preparations for an upcoming operation. The WARNORD is critical to foster parallel planning at the engineer unit and maneuver brigade levels.

There is no prescribed format for the WARNORD. It may be either written or oral but should include the following information:

Heading: WARNORDs must always begin with the words "Warning Order" to ensure recipients understand the information is for use only as a basis for planning and will be followed by orders. The addressees should also be listed in the heading. The DIVEN unit WARNORD should address all engineer units in the division.

Situation: This section includes a brief description of friendly and enemy situations and critical events. It may also include probable missions for the division and specified or implied tasks, and it may assign tentative tasks for planning only to engineer units.

Attachments/detachments: This section gives tentative and known changes to the task organization. However, it must be clear to engineers supporting maneuver brigades that changes in task organization are for planning and will not be effective until after an order is received from division by the supported brigade.

Earliest time of move: This section states the earliest possible time that units must be ready to move. For units under the DIVEN commander's command, actual movement times may be given, if known. The earliest time of move is critical to synchronizing sustainment operations to support future missions.

Nature and time of the operation: This section provides recipients with as much information about the division plan as possible to foster parallel planning and preparations and to set priorities. Depending on the maturity of the planning process, this section may include a concept of engineer operations or tentative scheme-of-engineer operations. Orders for preliminary action may also be included, assigning engineer tasks such as tactical/technical reconnaissance, establishing Class IV/V supplies (mine points for), and moving to linkup points. These orders are normally qualified as be prepared or on order tasks, depending on how the plan is established. Orders to engineers supporting maneuver brigades are always "on order" with execution instructions coming through maneuver headquarters-generated orders.

Time and place of orders group: Units under the DIVEN commander's command are told when and where to receive the entire order and who will attend. Units should

identify the composition of the orders group in their SOP.

Administrative/logistical information: This includes instructions and warning information on changes in unit logistics operations and lash-up with maneuver sustainment systems as required by future operations. This information may also direct movement to assembly areas and provide instructions for sustainment after movement.

Acknowledgement: An acknowledgement of receipt is always required to make sure it is received by all addressees.

DIVEN Unit OPORD. The DIVEN commander issues OPORDs to all engineer units under his command. The DIVEN commander's OPORD may initially include any engineer unit operating in the division area as necessary to effect the task organization, assign missions, and establish sustainment responsibility at the outset of an operation. However, once the task organization is effected, all instructions and missions to engineers supporting maneuver brigades are conveyed in division orders and are addressed to the maneuver brigade commanders. The following is an outline of the content of DIVEN unit OPORDs using the standard five-paragraph field order (Figures B-6 and B-7, pages B-15 through B-20). When the order is an OPLAN instead of an OPORD, assumptions on which the plan is based are included at the end of the "Situation" paragraph.

DIVEN Unit FRAGO. The DIVEN commander will frequently need to modify his OPORD through the use of FRAGOs to make changes in engineer operations that allow the division to take advantage of tactical opportunities. The DIVEN commander issues FRAGOs only to engineer units under his command. Changes in instructions to engineers supporting maneuver brigades in command relationships are conveyed through input into the division FRAGO. A FRAGO does not have a specified format, but an abbreviated OPORD format is usually used. The key to issuing a FRAGO is to maximize the use of the current OPORD by specifying only information and instructions that have changed. The DIVEN commander can rarely issue FRAGOs to his subordinate commanders face-to-face. He must normally issue FRAGOs over the radio. The DIVEN commander may use the XO or a member of his staff to issue the FRAGO in person to subordinate engineer commanders. This ensures that commanders understand the FRAGO and allows graphics to be provided. A FRAGO usually contains the following elements:

Changes to task organization: Any changes to unit task organizations made necessary by the modification to the order.

Situation: Includes a brief statement of current enemy and friendly situations which usually gives the reason for the FRAGO. It may also update subordinates on the current status of division-level engineer missions.

Concept: Gives changes to the scheme of engineer operations and the corresponding changes to subunit tasks. Must also include any changes in the division or DIVEN commander's intent.

Coordinating instructions: Includes changes to Service Support and Command and Signal paragraphs of the current OPORD made necessary by the change in scheme of engineer operations.

(Classification)

Copy _____of _____ copies
(Issuing engineer Headquarters)
(Place (coordinates) country)
(Date-time group, month, year)
(Message reference number)

OPERATION ORDER (number) (code name, if used)

Reference(s): Map(s) and other references required.
Time Zone Used Throughout the Order:

Task Organization:

- Include all engineer headquarters of units under division control.
- Include all engineer headquarters of organic units, if the OPORD is the initial order for the operation.
- List companies and special platoons task organized to headquarters other than their parent unit.
- May list special equipment, if not clear in unit task organization.
- Must streamline C2.
- Addresses command support relationships, as necessary.

1. SITUATION.

a. Enemy Forces.

(1) Terrain and weather.

- Key aspects of the terrain affecting operations.
- Key and decisive terrain in the division area that relates to operations.
- Expected weather conditions and impact on operations.
- Light data and impact on engineer missions.

(2) Enemy situation.

- Macro picture of enemy forces facing the division.
- Current disposition of enemy forces, including the location of major enemy units (known and plotted), strength, designation (if known), composition, and current activities.
- Enemy engineer activities and capabilities.
- Most probable enemy course of action.
- Enemy activities, capabilities, and courses of action that affect division-level engineer operations.

Figure B-6. DIVEN unit OPORD

b. Friendly Forces.

(1) Higher.

- Corps and division missions and commander's intent; paraphrase corps or division commander's intent as it applies to engineer operations.
- Brief description of the corps and division plans; highlight those aspects that give purpose to missions.
- Corps engineer plans and priorities; Where applicable, describe these as they apply to division engineer operations.

(2) Adjacent. Highlight missions of adjacent divisions and engineer units that impact on division missions.

c. Attachments and Detachments.

- List attachments and detachments of organic and supporting engineers to the division, as necessary, to clarify the task organization.
- Highlight any attachments and detachments that occur during the operation, including the time or event that triggers change.

2. MISSION.

- WHO is the DIVEN organization.
- WHAT, WHEN, WHERE, and WHY is the division mission.
- WHAT also includes any essential division-level engineer missions.

3. EXECUTION.

Intent: The DIVEN commander's intent for the operation.

- Gives the DIVEN commander's vision of the operation and how it supports the division plan.
- Describes the purpose of operations (WHY).
- Describes the "end state" of division-level operations and its link to the "end state" of the division operation.
- Does not describe the scheme of engineer operations or subunit tasks.
- Must link engineer intent to the division defeat mechanism.

a. Scheme of Engineer Operations.

- Must be a clear, concise narrative of the engineer plan from beginning to successful end. Uses phases of division plan, organization of the defense, or battlefield framework to organize the narrative.
- Must focus on mission-essential engineer missions and division engineer main effort only; it is not a summary of all engineer tasks. The DIVEN unit order will usually concentrate on engineer operations in the division rear or division-level missions in the close operation.

Figure B-6. DIVEN unit OPORD (continued)

- Must clearly identify the DIVEN unit's main effort and how it shifts during the operation to support the division plan.

(1) Obstacles.

- Supplements the narrative above, focusing specifically on the details of the countermobility effort. Based on the nature of division-level engineer missions, instructions may concentrate only on obstacles in the rear area.
- Identifies obstacle zones used to support division deep, close, and rear operations. Assigns zone responsibilities, priorities, and restrictions to division-level countermobility efforts and engineer units.
- Identifies and assigns responsibilities for division-directed and reserve targets to be prepared by division-controlled engineer units.

(2) Situational obstacles.

- Concept for the employment of situational obstacles, focusing on how they will be used to complement or augment conventional tactical obstacle efforts.
- Discussion must include the details on NAIs, TAIs, decision points, and execution criteria if the scatterable mine target is division directed and executed by division-controlled engineer units.
- Clearly state the headquarters maintaining the authority to use scatterable mines and any restrictions on duration (by zone).

b. Tasks to Subordinate Units.

- Clear, concise listing of all tasks assigned to engineer units remaining under the DIVEN commander's control.
- Each engineer battalion and separate company headquarters remaining under the DIVEN commander's control.
- Tasks assigned by unit and generally listed in the order they will be executed during the operation.
- Clearly distinguished "be prepared" and "on order" tasks from normal tasks.
- Tasks/instructions common to two or more units are not included.
- All division-level missions identified during the estimate process, if necessary.

c. Coordinating Instructions.

- Includes tasks and instructions that are common to two or more units subordinate to the DIVEN organization.
- Must include all pertinent coordinating instructions listed in the division order.
- Does not list SOP orders unless needed for emphasis or changed due to the mission.
- May include reporting requirements common to two or more units if not covered in "Signal" paragraph.

Figure B-6. DIVEN unit OPORD (continued)

- May authorize direct coordination between subordinate or adjacent engineer-specific tasks.
- Gives the time task organization is effective.

4. SERVICE SUPPORT.

a. General Concept of Logistic Support.

- Provide subordinates with the general concept of logistic support for units under the DIVEN commander's control throughout the operation.
- Identify, in general, primary and backup (emergency) means of subunit sustainment for each type of engineer unit under the DIVEN commander's control. Must address WHO (organic battalions under division control, corps battalions, or special separate companies); HOW (area support, unit support, supply point distribution, unit distribution); WHERE (corps storage area (CSA), DSA, BSAs, division MSB/FSBs, CSGs); and WHAT (classes of supply and critical services).
- Must be consistent with task organization and command support relationships.
- Make maximum reference to division CSS graphics.
- List the locations of key CSS nodes as they apply to the concept for logistic support (DSA, FSBs, CSA, CSG, ammunition supply points (ASPs)/ammunition transfer points (ATPs), and so forth) and planned subsequent locations, if they change during the operation.

b. Materiel and Services.

(1) Supply. For each class of supply--

- List allocation and CSRs for each unit, based on missions.
- List basic loads to be maintained by unit.
- List method of obtaining supplies if different from general concept. **NOTE: Mission logistics may be different than unit (scheduled) logistics.**
- Address any special arrangements or plans to sustain specific mission needs (Class IV/V or Class III push to sustain engineer preparation of defenses).

(2) Transportation.

- Primary, alternate, and "dirty" MSRs during the operation.
- Allocations of division or corps haul assets.

(3) Services. For each service, list the location and means of requesting and obtaining services.

c. Medical Evacuation and Hospitalization. For each type of engineer unit, indicate the primary and backup means of medical evacuation and hospitalization, including locations of health service facilities providing support on area or unit basis.

d. Personnel.

- Method of handling EPWs and locations of EPW collection points.

Figure B-6. DIVEN unit OPORD (continued)

- Method of receiving mail, religious services, and graves registration for each type of unit under the DIVEN commander's control.

c. Civil-Military Cooperation. Engineer supplies, services, or equipment provided by host nation.

f. Miscellaneous.

5. COMMAND AND SIGNAL.

a. Command.

- Location of key leaders and DIVEN CPs during the operation and planned movements.
- Location and planned movements of key division C2 nodes.
- Designated logical chain of command.

b. Signal.

- Identify any communication/signal peculiarities for the operation not covered in the SOP.
- May designate critical reporting requirements of subordinates, if not covered in coordinating instructions or SOP.
- Designate frequency-modulated (FM) nets subordinates to DIVEN unit command and operations and intelligence (O/I) nets. Designate net for mission and routine reports.

Acknowledge

DIVEN's Signature (optional)
DIVEN's last name
Rank

OFFICIAL:
(Authentication)

Annexes: Possible annexes may include but are not limited to—
- Execution Matrix
- Intelligence Annex
- CSS Annex
- Movement Annex

Overlays:
- Situation Template
- Engineer Operations Overlay: Includes division maneuver graphics and engineer graphics, as necessary.
- Division CSS Overlay.
- Division Obstacle Plan.
- Other Operations: River-Crossing, Large-Scale Breach, and Base Camp/Base Cluster Defenses.

Distribution:

Figure B-6. DIVEN unit OPORD (continued)

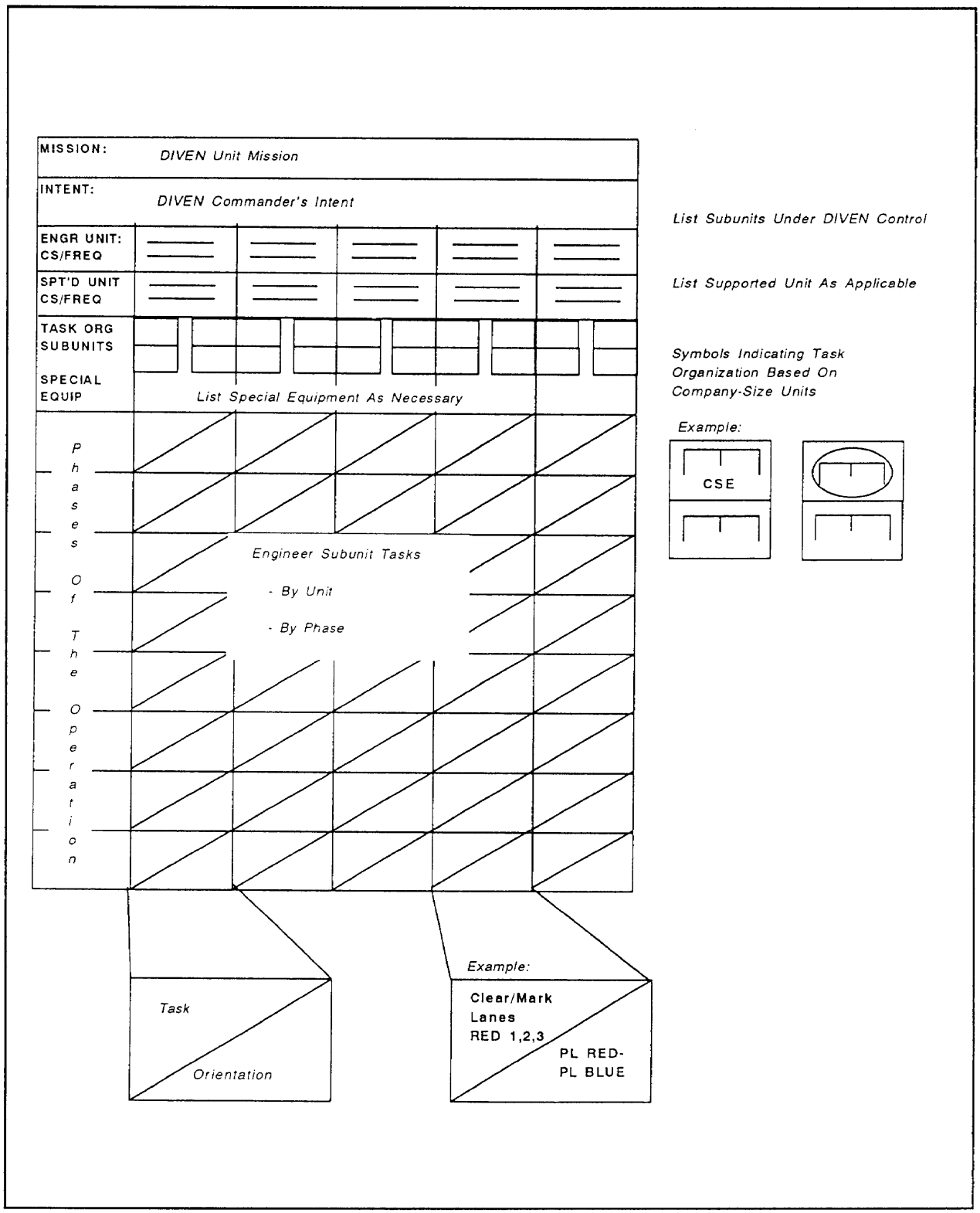


Figure B-7. Engineer execution matrix

APPENDIX C

KEY LEADER RESPONSIBILITIES

This appendix outlines key duties and responsibilities of several of the following principal leaders in the division engineer organization:

- Commander.
- XO.
- ADE.
- Command Sergeant Major (CSM).
- Sl.
- S2.
- S3.
- S4.
- Division TAC CP Engineer.
- Division Rear CP Engineer.
- Maintenance Officer.
- Chemical Officer.
- Signal Officer.
- Chaplain.

The duties described are a foundation of mission-essential tasks required of engineer key leaders. The commander may modify the duties and responsibilities based on METT-T and on the structure of the division and division engineer organization.

Engineer leaders have functional area responsibilities for both the division and the division engineer organization. Engineer functional area responsibilities are listed below as division staff and unit responsibilities. Overall staff responsibilities are listed by staff area in FM 101-5.

Commander

Division Staff Responsibilities. The commander–

- Serves as the division engineer, the division commander's principal advisor on engineer operations.
- Formulates concepts for engineer support to meet the division commander's intent.
- Makes recommendations to the division commander concerning engineer priorities and acceptable risks.
- Provides functional control of all engineer forces working in the division area through input into division orders.
- Makes recommendations to the division commander concerning task organization of engineer forces to support the division commander's intent.
- Serves as the principal advisor for integrating specified and implied engineer tasks into the division plan.

Unit Responsibilities. The commander–

- Commands all engineer forces that are organic to the division and not task organized in a command relationship below division level.
- Commands all units, engineer or otherwise, assigned, attached, or OPCON to the division engineer organization.
- Assigns specific missions to subordinate units through engineer organization OPORDs.
- Analyzes unit performance, anticipates changes, and issues the necessary FRAGOs to subordinate units.

The division engineer organization commander, while exercising his engineer command and division staff responsibilities, must have the necessary equipment to travel and communicate with both his subordinate units and the division commander and staff.

XO

Division Staff Responsibilities. The XO–

- Is prepared to do the functions of the division engineer.
- Focuses on priorities set by the engineer organization commander.

Unit Responsibilities. The XO–

- Serves as 2IC of the division engineer organization and requires the same type vehicle and communications capability as the commander.
- Synchronizes the engineer organization staff.
- Supervises the development of DIVEN orders to subordinate units.
- Focuses the staff on future operations and requirements at ADE/division main or rear.
- Synchronizes all unit CSS operations in the engineer organization.
- Is responsible for the duties of the XO, as outlined in FM 101-5.

CSM

Division Staff Responsibilities. The CSM–

- Performs functions as tasked by the engineer organization commander.
- May serve as an engineer LNO to higher, adjacent, or subordinate units.
- May serve as an integrator or expediter in any functional area, as dictated by the division engineer.

Unit Responsibilities.

- Is responsible for the duties outlined in FM 101-5.
- Is the commander's primary representative on matters of soldier morale and welfare.

The range of the CSM's soldier morale and welfare responsibilities coupled with special missions he will be tasked with require him

to operate from the forward line of own troops (FLOT) to the corps support area. The CSM must be equipped with a vehicle and communications system that allow him to travel and communicate long distances in varied terrain.

S1

Division Staff Responsibilities. The Sl–

- Assists the ADE in the development of engineer plans and orders.
- Is the primary interface with the G1.
- Provides input to the engineer CSS portions of the basic division plan and engineer annex.

Unit Functions. The Sl–

- Is responsible for all duties of the personnel officer, as outlined in FM 101-5.
- Develops the personnel portion of the engineer CSS plan for inclusion in the engineer unit OPORD.
- Coordinates engineer CSS functions between the DIVEN MAIN and REAR CPs.
- Provides detailed engineer CSS input to the DIVEN MAIN for inclusion in division plans.

S2

Division Staff Responsibilities. The S2–

- Serves as the division's expert on threat engineer operations.
- Supports the ADE as he coordinates with the G2 to analyze and determine the impact of intelligence from all sources.
- Supports the ADE as he provides the G2 with threat engineer information for inclusion into division plans.
- Supports the ADE as he provides engineer-specific input to the division IPB.

Unit Responsibilities. The S2–

- Is responsible for all duties of the intelligence officer, as outlined in FM 101-5.
- Continually updates the DIVEN commander on the general threat situation, threat engineer capability, intent, and actions.
- Serves as a shift officer at the DIVEN MAIN CP.
- Provides the engineer organization S3 with detailed enemy information for inelusion into engineer organization plans and orders.

S3

Division Staff Responsibilities. The S3 assists the ADE and division TAC CP engineer in their functions, when necessary.

Unit Responsibilities. The S3–

- Is responsible for all functions of the operations officer, as outlined in FM 101-5.
- Serves as the officer in charge (OIC) of the DIVEN TAC CP, when formed.
- Coordinates the execution of the division's scheme of engineer operations for DIVEN subordinate units conducting current close operations.
- Synchronizes the unity of engineer effort between adjacent maneuver brigades for DIVEN subordinate units.
- Receives, analyzes, and posts combat intelligence that affects engineer operations in the current close fight.
- Receives, analyzes, and posts current and DIVEN subordinate units statuses.
- Passes engineer requirements and reports from forward DIVEN subordinate units to the DIVEN MAIN CP.
- Provides NCS for the DIVEN command net.
- Provides current close operations information to the DIVEN MAIN.

In many instances, the DIVEN S3 is required to move to the division TAC CP. Additionally, he is required to occupy forward positions during river-crossing, large-scale breaching, and other special operations. The DIVEN S3 must be equipped with a vehicle and a communications system that are mobile, survivable, and capable of long-range communications with the DIVEN commander, subordinate units, and the ADE.

S4

Division Staff Responsibilities. The S4–

- Assists the division rear CP engineer in providing engineer staff expertise to the division rear commander to assist in planning, executing, and synchronizing division rear operations, when necessary.
- Provides advice and assistance to the G4 and other brigade S4s in planning required engineer material.

Unit Responsibilities. The S4–

- Serves as the OIC of the DIVEN REAR CP.
- Provides C2 for all DIVEN subordinate units committed to the rear area engineer mission on behalf of the division engineer organization commander.
- Executes DIVEN subordinate unit current rear area engineer operations according to the division's scheme of engineer operations.
- Receives, analyzes, and tracks rear area engineer operations for and reports to the DIVEN MAIN.
- Provides engineer recommendations and resource requirements for base cluster defenses.
- Identifies and forwards engineer support requirements for force sustainment, terrain management, movement control, and force protection to the DIVEN MAIN CP.

- Prepares to assume the duties of the DIVEN MAIN, if necessary; duplicates DIVEN MAIN battle tracking.
- Provides detailed engineer CSS input to the DIVEN MAIN for inclusion in division plans.
- Coordinates unit and mission CSS issues with the G4 and DISCOM for DIVEN subordinate units working in the division rear area.
- Is responsible for all duties of the logistics officer, as outlined in FM 101-5.
- Integrates engineer CSS activities into the division CSS system.
- Provides detailed engineer CSS input to the DIVEN MAIN CP for inclusion in engineer unit orders.
- Synchronizes the execution of all logistics functions for engineer units operating in the division AO.

A D E

Division Staff Responsibilities. The ADE is the division engineer's primary point of contact (POC) on functional matters with division plans and current operations cells. He performs his functional responsibilities on behalf of the DIVEN. The ADE–

- Is the OIC of the assistant division engineer section.
- Tracks all mobility, countermobility, survivability (M/CM/S) and sustainment engineer aspects of the deep, close, and rear battle through close coordination with the DIVEN division TAC and REAR CPs engineers.
- Assists the division main CP's current operations element and synchronizes engineer support to the current close and rear fights.
- Coordinates closely with the G2, G3, and division main CP's plans element to ensure engineer integration into future operations.
- Develops scheme of engineer operations for future deep, close, and rear operations.
- Allocates engineer resources for deep, close, and rear operations; recommends the engineer task organization.
- Synchronizes and integrates engineers into the division plan and unit-level division scheme of engineer operations.
- Prepares engineer input into the division's basic order and engineer annex.
- Processes engineer requirements identified by the division TAC and rear CPs; resolves conflicts and integrates into future plans.
- Coordinates engineer functions with adjacent divisions and the higher engineer headquarters staff engineer; maintains a data base to facilitate the transfer of information.
- Receives, posts, and analyzes combat intelligence, focusing on its impact on future plans.
- Interfaces with corps engineer on corps engineer plans, statuses of division engineer missions, and the identification of division requirements for corps engineer assets.

GLOSSARY

1SG	first sergeant
2IC	second in command
A2C2	airspace command and control
A&O	assault and obstacle
AATF	air assault task force
ACE	armored combat earthmover
AD	air defense
ADA	air defense artillery
ADAM	area denial artillery munition
ADC-M	assistant division commander for maneuver
ADC-S	assistant division commander for support
ADE	Assistant Division Engineer
admin	administrative
ADP	automated data processing
ADSO	assistant division signal officer
AFB	assault float bridge
AG	Adjutant General
AMB	ambulance
AO	area of operations
AP	antipersonnel
ARNG	Army National Guard
arty	artillery
ASAP	as soon as possible
ASP	ammunition supply point
ASPS	all-source production section

assault The culmination of an attack which closes with the enemy. A phase of an airborne or air assault operation beginning with delivery of the assault force into the objective area and extending through the attack of objectives and consolidation of the initial airhead. To make a short, violent attack against a local objective, such as a gun emplacement or fortified area.

assault breach A breach tactic used by small units (company teams and platoons) to penetrate an enemy's protective obstacles and seize a foothold within his defense. Normally a very decentralized operation with SOSR synchronized at the platoon and squad level.

assault force In a breach operation, those forces charged with passing through a breach- and enemy-fortified position or strongpoint and seizing the objective or completing destruction of the enemy. One of the three breach organizations.

asst assistant

AT antitank

atk attack

ATKHB attack helicopter battalion

ATP ammunition transfer point

att attached

ATTN attention

AV aviation

AVLB armored vehicle launched bridge

BAI battlefield air interdiction

base A locality from which operations are projected or supported. An area or locality containing installations that provide logistic or other support. A unit or multiunit position that has a definite perimeter.

base cluster Bases in the rear area grouped for rear battle or mission-related purposes. A base cluster has no clearly defined perimeter. A base cluster operations center (BCOC) is established to perform the coordination functions of the rear battle.

bde brigade

BHL battle handover line

block A tactical obstacle intent used to integrate fire planning and obstacle effort to stop an attacker along a specific avenue of approach. Requires extensive obstacle effort and overwhelming direct and indirect fires. Obstacles must be tied into terrain and allow no bypass. The blocking intent is conveyed through the block graphics.

bn battalion

BOS battlefield operating system

breach force A combined arms force task organized with the maneuver and engineer forces necessary to reduce lanes through an obstacle and pass initial assault forces through the lanes. The force is typically mobility heavy using maneuver or engineer forces. When made up primarily of engineers, the force must also be organized with the maneuver forces necessary for local direct-fire suppression and security at a local level. One of the three breach organizations.

BSA brigade support area

C courier

C2 command and control

C3 command, control, and communications

CAS close air support

CATK counterattack

CAV cavalry

cbt combat

CDR commander

CEB clothing, equipment, and bath

CESO communications-electronics signal officer

CEV combat engineer vehicle

CFA covering force area

CFL coordinated fire line

CL class

Class I A category of supply which includes meals and rations.

Class III A category of supply which includes petroleum, oils, and lubricants.

Class IV A category of supply which includes construction and barrier materials.

Class V A category of supply which includes ammunition.

Class VIII A category of supply which includes medical material.

Class IX A category of supply which includes repair parts and components.

Class IV and V supply point The location of obstacle and survivability materials in the task force sector.

classes of supplies The grouping of supplies, by type, into 10 categories to facilitate supply management and planning.

clearing operations The total elimination of an obstacle or unexploded ordnance over a defined area. Normally, clearing is a sustainment engineer task conducted well after total elimination of all direct and indirect fires able to cover the obstacle. Clearing is an extremely resource intensive and slow operation and typically assigned to provide general support to a higher unit.

CM countermobility

CM/S countermobility and survivability

cmd command

co company

control measures Directives given graphically or orally by a commander to subordinate commands in order to assign responsibilities, coordinate fires and maneuver, and control combat operations.

CONUS continental United States

COSCOM corps support command

countermobility (CM) The use of tactical obstacles and fires to attack the enemy's maneuver to the advantage of the defender. The combination of fires and obstacles create a vulnerability that friendly forces can exploit by fire, maneuver, or a combination.

countermine A subcomponent of mobility that concentrates solely on the actions taken to counteract a mine or minefield through detecting, reducing, or bypassing.

covert breach A breach tactic used when the force must reduce lanes through enemy tactical or protective obstacles undetected. Normally, the covert breach is used when mission success depends on achieving surprise at the expense of speed or mass.

CP command post

CS combat support

CSA corps storage area

CSE combat support equipment

CSG corps support group

CSM command sergeant major

CSR control supply route

CSS combat service support

DA Department of the Army

DAO division aviation officer

DATK deliberate attack

defined target Refers to the enemy whose ability to maneuver is the target of the obstacle and fire plan. The target is relative to the subordinate unit's force allocation ratio. An armored maneuver brigade conducting a prepared defense will fight an enemy's division. Maneuver battalions and companies in a prepared defense will fight an enemy's brigades or regiments and battalion, respectively.

deliberate breach A breach tactic used when forces necessary for suppressing, obscuring, reducing, and securing a lane through an obstacle are beyond the capability of a subordinate unit. This type of breach requires one or more subordinate units to be task organized and assigned specific support, breaching, and assault responsibilities. Characterized by centralized planning, preparation, and execution.

det detachment

directed obstacle Obstacles directed by a higher commander as a specified task to a subordinate unit. Directed obstacles must always fall within the obstacle zones or belts designated by higher. They may or may not be part of the directing unit's belts or groups.

DISCOM division support command

disrupt A tactical obstacle intent to focus fire planning and obstacle effort to break up an enemy's formation, interrupt his time table, cause the premature commitment of breach assets, and piecemeal his attack. May be used to separate combat echelons or combat forces from their logistical support. The disrupt intent is conveyed through the disrupt graphic.

div division

DIVEN division engineer

doctrinal template A model based on postulated enemy tactical doctrine. It generally portrays frontages, depths, echelon spacing, and force composition, as well as the disposition of combat, CS, and CSS units for a given type of operation. It portrays how the enemy would like to fight if he was not constrained.

DP decision point

DREAR division rear command post

DS direct support

DSA division support area

DTAC division tactical command post

DTOC division tactical operations center

DZ drop zone

EA engagement area

EAC echelons above corps

EAD echelons above division

EBA engineer battlefield assessment

engineer battlefield assessment (EBA) That part of the engineer's planning process that complements the development of facts and assumptions during the mission analysis phase of the tactical decision-making process. EBA has three components: terrain analysis, enemy M/S, and friendly M/S capability.

EFSP engineer forward supply point

engr engineer

EOD explosive ordnance disposal

EPW enemy prisoner of war

equip equipment

EVAC evacuation

EW electronic warfare

EWL engineer work lines

FA field artillery

FACE forward aviation combat engineering

FARP forward area rearm/refuel point

FASCAM family of scatterable mines

FEBA forward edge of the battle area

fix A tactical obstacle intent to focus fire planning and obstacle effort to slow an attacker within a specified area, normally EA. Obstacle and fires are planned in depth and build with intensity to complete the enemy's destruction within the specified area. The fix intent is conveyed using the fix graphic.

fld field

FLOT forward line of own troops

FM field manual

FM frequency modulated

force protection Countermobility, survivability, and security measures a commander uses to ensure the integrity of his force throughout an operation. Normally conducted in a LIC or in rear areas against a viable rear area threat.

forward aviation combat engineering (FACE) A mobility operation in which engineers perform missions in support of forward aviation ground facilities. Such missions include reconnaissance; construction of low-altitude parachute extraction zones, landing strips, and airstrips; and providing berms, revetments, and trenches for FARPs.

FRAGO fragmentary order

freq frequency

FS fire support

FSB forward support battalion

FSCL fire-support coordination line

FSCOORD fire-support coordinator

fwd forward

G1 Assistant Chief of Staff, G1 (Personnel)

G2 Assistant Chief of Staff, G2 (Intelligence)

G3 Assistant Chief of Staff, G3 (Operations and Plans)

G4 Assistant Chief of Staff, G4 (Logistics)

grp group

GS general support

GSR ground surveillance radar

HATK hasty attack

HEMTT heavy expanded mobility tactical truck

HHC headquarters and headquarters company

HHD headquarters and headquarters detachment

HMMWV high-mobility multipurpose wheeled vehicle

HQ headquarters

HRP highway regulating point

HTF how to fight

HVT high-value target

hvy heavy

IEW intelligence electronic warfare

inf infantry

info information

in-stride breach A breach tactic used when the assets needed to suppress, obscure, secure, and reduce a lane through an obstacle can be task organized into a subordinate unit. Normally used against lightly defended obstacles or when the situation is unclear. Planning centers around the allocation of resources to subordinates; breach execution is decentralized.

intel intelligence

INTSUM intelligence summary

IPB intelligence preparation of the battlefield

IR information requirements

ISB intermediate staging base

JAAT joint air attack team

JSEAD joint SEAD

JTF joint task force

lane A route through an enemy or friendly obstacle which provides a passing force safe passage. The route may be reduced and proofed as part of a breaching operation or constructed as part of a friendly obstacle. A lane must be 1 meter wide for dismounted column movement and 4.5 meters wide for single-lane column movement. A two-way mounted lane is 10 meters wide.

lane marking Those devices emplaced on a reduced and proofed lane that define the lane's entrance, exit, width, and path for the passing force. There are five types of markers used in lane marking:

Entrance/exit markers: Markers placed at the entrance and exit points of a lane defining the start or end of the reduced lane through the obstacle. They signify the point at which movement is restricted to the lane and the width of the reduced lane. Entrance and exit markers are visually different from all other lane markers.

Handrail markers: Markers placed at the left (relative to the direction of travel) limit of the reduced lane along the entire path of the lane through the obstacle. They define the path of the lane through the obstacle and with the entrance and exit markers, the width of the path. Left handrail is minimum, but a lane may be marked with both left and right handrails.

Funnel markers: Markers placed forward of the entrance or past the exit that augment the visual signature of the entrance and exit markers. They assist the passing unit in making final adjustments to their combat column before entering the lane.

Far recognition markers: A marker placed well forward of the lane entrance used to guide larger formations (battalion and above) to the breach site. Signifies the point at which passing forces begin transition to combat column.

LC line of contact

LD line of departure

LEC light equipment company

LIC low-intensity conflict

LNO liaison officer

LOA limit of advance

LOC lines of communication

log logistics

LOGPAC logistical package

LRSD long-range surveillance detachment

lt light

LZ landing zone

m meter

M/CM/S mobility, countermobility, and survivability

M/S mobility and survivability

MBA main battle area

MCSR material condition status report

mech mechanized

METT-T mission, enemy, terrain, troops, and time available

MGB medium girder bridge

MI military intelligence

MICLIC mine-clearing line charge

mobility All aspects of an operation which provide the commander with freedom to maneuver and sustain combat power at the place and time of this choosing. In the context of the BOS mobility, all aspects of an operation which attack the enemy's maneuver.

MOPMS modular pack mine system

MOUT military operations on urbanized terrain

MRR motorized rifle regiment

MSB main support battalion

MSR main supply route

MTC movement to contact

mvmt movement

NAI named areas of interest

NBC nuclear, biological, chemical

NCO noncommissioned officer

NCOIC noncommissioned officer in charge

NCS net control station

NFA no-fire area

no number

O/I operations and intelligence

O/O on order

obj objective

obscure The use of terrain, man-made obscurants, or limited visibility to hamper the enemy's observation or target acquisition of friendly forces. In a breach operation, one of the four breaching fundamentals.

obstacle Any physical characteristic of the terrain (natural, cultural, or man-made) which impedes the mobility of a force. Obstacles are categorized into two fundamental types: existing and reinforcing.

Existing obstacles: Any natural or cultural attributes of the terrain that impede a force's movement. For example, no-go terrain, population centers, elevated railways/roadways, and waterways.

Reinforcing obstacles: Obstacles specifically constructed, emplaced, or detonated by enemy or friendly forces. Reinforcing obstacles are further categorized as tactical or protective obstacles.

obstacle belt A graphical obstacle control measure used by brigades to designate an area within an approved obstacle zone in which subordinate units are authorized to emplace tactical obstacles. Obstacle belts are designated with a specific obstacle intent (disrupt, turn, fix, and block) that focuses the integration of obstacle groups within the belt to support the brigade scheme of maneuver. Normally, belts are allocated against regimental or brigade avenues of approach. Obstacle belts do not cross subunit boundaries one level down.

obstacle effect Conveyed through the use of graphics. Each symbol represents exactly how the enemy's maneuver should be altered. Refer to obstacle intent.

obstacle group An array of individual tactical obstacles within an obstacle belt whose combined effect accomplishes a single obstacle intent (disrupt, turn, fix, or block). Planned by battalion- and below-sized forces against battalion- and separate company-sized avenues of approach. Is used to synchronize obstacle effect and overwatching direct- or indirect-fire lanes. When more than one obstacle group is used within an obstacle belt, the sum effect of the groups must accomplish the intent of the obstacle belt. Graphically portrayed on the obstacle plan at task force and below using the obstacle intent graphics.

obstacle handover The transfer of responsibility for an obstacle between emplacing and overwatching units.

obstacle intent Used by the maneuver commander to convey the effect tactical obstacles and fires must have on the enemy's maneuver. Obstacle intent identifies the target (enemy force), the effect (disrupt, turn, fix, or block), and a relative location on the battlefield in which the intent is to occur. In short, it defines the end state that must be achieved by fires and obstacles for success. Is part of all obstacle plans at brigade and below.

obstacle intent graphics Graphics that display the end state or overall purpose of the obstacle belt/group/zones.

obstacle plan A comprehensive, coordinated plan which integrates the use of tactical and protective obstacles to support a scheme of maneuver. The plan designates obstacle responsibilities, general location, directed/reserve obstacles, and special instructions. It is normally prepared as an annex to an OPLAN or OPORD at corps level and below. Depending on the echelon, the plan may include obstacle control measures (obstacle zones, belts, groups), location of directed/reserve obstacles, obstacle intent, priority, and associated obstacle restrictions. May also include a consolidated obstacle target list.

obstacle restrictions Limits on the method, type, and location of obstacles authorized to be emplaced within an obstacle zone or belt. Allows the commander to preclude the use of obstacles which may impact on future operations. Obstacle restrictions are defined by belt or zone in the obstacle plan.

obstacle zones A graphical obstacle control measure used by division or corps to designate an area in which subordinate brigades or divisions are authorized to emplace tactical obstacles. Normally, obstacle zones are allocated against divisional avenues of approach. Obstacle zones do not cross unit boundaries one level down.

OBSTINTEL obstacle intelligence

OBSTINTEL The plotting, reconnaissance, and analysis of the enemy's obstacle effort as part of the overall IPB and reconnaissance and surveillance effort. Includes obstacle location, orientation, composition, and integration with enemy direct- and indirect-fire plans.

OCOKA observation and fields of fire, cover and concealment, obstacles, key terrain, avenues of approach

OIC officer in charge

OPCON operational control

OPLAN operation plan

OPORD operation order

OPS operations

OPSEC operations security

PIR priority intelligence requirements

PL phase line

plt platoon

poc point of contact

prep preparation

protective obstacles Used to protect the force from the enemy's final assault onto the force's position. Protective obstacles are close to the defensive positions and are tied in with the final protective fire of the defending unit.

PS personnel services

PSC personnel services company

PSNCO personnel services noncommissioned officer

PZ pickup zone

qty quantity

R&S reconnaissance and surveillance

RAAMS remote antiarmor mine system

RB ribbon bridge

rcvy recovery

REDCON readiness condition

reduce The creation of a lane through, over, or around an obstacle. In the case of minefields, refers to destroying, neutralizing, removing, or bypassing mines. In a breach operation, one of the four breaching fundamentals.

relative location Refers to the use of obstacle control measures on the battlefield.

REPL replacement

reserve obstacle Directed obstacles which the commander restricts execution authority. The directing commander usually specifies the unit responsible for obstacle emplacement, handover, and execution. The commander must clearly identify the conditions under which the obstacle is to be executed.

rqr required

RRP replacement receiving point

RSR required supply rate

/s/ signature

S support

S1 Adjutant (US Army)

S2 Intelligence Officer (US Army)

S3 Operations and Training Officer (US Army)

S4 Supply Officer (US Army)

SCATMINE scatterable mine

scatterable mine A mine laid without regard to classical pattern that is designed to be delivered by aircraft, artillery, missile, or ground dispenser or to be hand thrown. It will normally have a limited laid life.

SEAD suppression of enemy air defenses

sect section

secure In a breaching operation, those actions which eliminate the enemy's ability to interfere with the reduction and passage of combat power through a lane. Secure may be accomplished by maneuver or by fires. One of the four breaching fundamentals.

SEE small emplacement excavator

situational obstacle A tactical obstacle emplacement capability held in reserve. Execution is triggered by friendly actions, enemy actions, or a combination and can be a prepared or an on-order mission. Can only be used in an approved zone or belt and requires complete integration into the decision support template. Includes the full range of obstacle assets, not just scatterable mines.

SOCCE special operations command and control element

SOF special operating force

SOP standing operating procedure

SOSR suppress, obscure, secure, and reduce

spt support

sqdn squadron

ST student text

STANAG Standardization Agreement

suppress The focus of all available fires on enemy personnel, weapons, or equipment to prevent effective fires on friendly forces. Suppressive fires include the full range of weapons from direct and indirect fires, electronic countermeasures, and directed energy. The purpose of suppression is to protect forces reducing and maneuvering through the obstacle and to soften the initial foothold (assault force objective).

support force That force in a breaching operation whose mission is to eliminate enemy interference with the breach through suppressive direct and indirect fires. The support force missions include but are not limited to--isolating the breach site by focusing overwhelming fires on those enemy weapons overwatching the obstacle; preventing any repositioning or counterattack threatening the breach; controlling the use of indirect fires and obscuration; and softening the initial foothold on the objective. The support force is one of the three breach organizations used in a breaching operation.

survivability The full range of measures taken by a commander to protect his force (personnel, equipment, and supplies) from an enemy's attack. Includes the use of fortifications, protective obstacles, strongpoints, camouflage, and deception to give the total force the edge needed to survive the battlefield.

sustainment engineering Those missions or tasks assigned to provide engineer units general support to a division or above that provide the force with troop construction, logistical facilities, LOCs, airfield damage repair, and obstacle clearing necessary for continuous combat operations. Normally these operations are confined to the rear area of divisions and above.

SUPREP supply report

surg surgical

svc service

TAC tactical

tactical obstacles Those obstacles used to directly attack the enemy's ability to maneuver, mass, and reinforce in support of the force's direct- and indirect-fire lanes and tactical repositioning. When employed, individual tactical obstacles make up obstacle groups or directed obstacles. Tactical obstacles are numbered, using a 12-character alphanumeric designator.

TAI targeted area of interest

TACON tactical control

TF task force

TOE table(s) of organization and equipment

TOW tube-launched, optically-tracked, wire-guided

TRADOC United States Army Training and Doctrine Command

trans transportation

trmt treatment

TTP tactics, techniques, and procedures

turn A tactical obstacle intent used to integrate fire planning and obstacle effort to divert an enemy formation off one avenue of approach to an adjacent avenue in support of the scheme of maneuver. Requires well-defined mobility corridors and avenues of approach. The combination of obstacles and fires must be impenetrable at the point (apex) where the turn begins. Fire control must be planned to maintain pressure on the enemy throughout the turn and exploit his exposed flank. The turn intent is conveyed using the turn graphic.

US United States

USAR United States Army Reserves

UXO unexploded ordnance

w/ with

WARNORD warning order

XO executive officer

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FM 71-2. *The Tank and Mechanized Infantry Task Force.* 27 September 1988.

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